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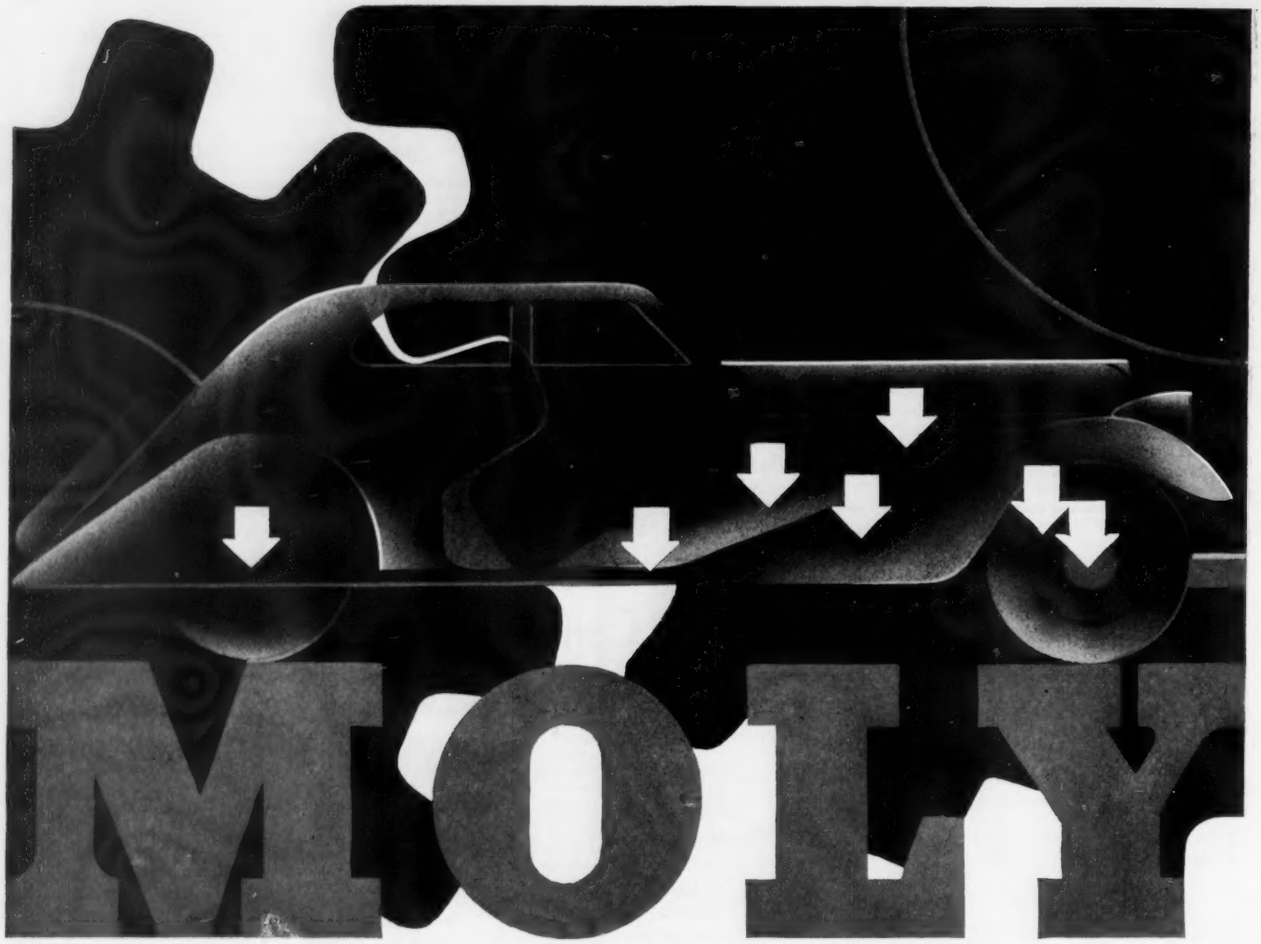

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As the Editor Views the News

EVENTS of the past week indicate that the nation is moving steadily toward a showdown on the issue of recovery versus reform. In his fireside chat of April 28, the President dealt almost exclusively with relief and long-term correctives, rather than with measures which would stimulate recovery immediately, ease the burden of relief and pave the way for intelligent, well-ordered reform later on. The talk showed that the President still distrusts business. It revealed again his belief in the doctrine of expanding the power and broadening the activities of the government, and of restricting more and more the freedom of industry.

• • •

Reform or Recovery?

Of course, this view is diametrically opposed to that held by the majority of business executives. This was shown by the outspoken criticism of the new deal at the annual meeting of the United States chamber of commerce last week and by resolutions passed by that body. The gulf between Rooseveltian ideas and those of industry again is revealed in the discussions (p. 29) relative to extending the term of NIRA. Sooner or later these differences must be ironed out. As a nation, we must decide whether we want reform or recovery. In the end, recovery will be preferred. Then industry will be vindicated!

• • •

Where the Money Goes!

The exchange of opinions on export trade between Chester C. Davis of AAA and Alfred P. Sloan Jr. of General Motors (p. 19) is another indication of the widening breach between business and the new deal. Mr. Davis suggested that the United States make Europe buy more cotton by refusing to sell Europe all the American manufactured products it wants. Mr. Sloan countered with a clear-cut statement to the effect that the European importer spends his money for automobiles instead of cotton because he can get greater value for his money. In conclusion, Mr. Sloan explained that he replied to Mr. Davis "in the hope of discouraging what will turn out to be another excursion into economic wonderland." It is to be hoped that Mr. Sloan and other industrialists will continue to drive home to new dealers the true relation of value, price and volume.

• • •

Earnings Are Mounting

Reports of steel companies for the first quarter (p. 16) and the detailed analysis of earnings for the year 1934 (p. 30) show an encouraging improvement, but the industry still has a long way to go before it can expect to earn an adequate return on its investment. Even in the first quarter of 1935, when operations averaged 49.32 per cent of capacity, many of the integrated producers reported deficits. Incidentally, a comparison of the annual earnings of the 23 reporting companies does not show that the large corporations fared better than the smaller interests, as charged by certain political critics. The reverse is indicated.

• • •

Broad Strip—for what?

Closely related to the earning power of the industry in future years is the problem of new finishing mill capacity for flat rolled products. Recently, an engineer at Youngstown declared (p. 58) that the 20 broad strip mills which probably will be in existence at the end of 1935 will have a capacity of 9,000,000 tons and will represent an investment of from $250,000,000 to $275,000,000. Undoubtedly many of these mills were installed to protect their owners' interests in certain markets. How can these markets be expected to engage the tremendous new capacity? That is one of steel's major merchandising problems. Our guess is that the answer lies in the construction and furnishing of American homes—such as are now being erected (p. 17) in Washington.

E. L. Shaner

Republic-Corrigan Merger Upheld in Ruling Broadly Interpreting Clayton Act

REPUBLIC STEEL CORP., Youngstown, O., and Corrigan, McKinney Steel Co., Cleveland, won a smashing victory and industry in general received a broad, helpful interpretation of the Clayton act when Judge Fred M. Raymond, of Grand Rapids, Mich., Friday at Cleveland dismissed the department of justice suit aimed at the Republic-Corrigan merger.

Interpreting section 7 of the Clayton act, which forbids consolidations tending substantially to lessen competition, Judge Raymond upheld the contentions of the steel companies in every important particular.

He ruled that "the record is devoid of proof that consummation of the merger contract would in any sense be inimical to the interests of the people." He declared further that "there is nothing . . . to increase the price of any iron or steel product, to create a monopoly, to achieve a mere increase in size, or to ultimately bring about further mergers."

Sees Beneficial Results

Going even further, Judge Raymond maintained that "the result of combinations and mergers may be and not uncommonly is to save overhead, increase mass production, reduce prices and improve the product. . . . The elimination in such cases of the competition between merging companies is a step in the strengthening of competition. . . . Therefore, instead of a probable injury to the public the interest of the public will be enhanced."

The position of Republic and Corrigan, with the latter's subsidiaries —Newton Steel Co. and N. & G. Taylor Co.—is that they are ready to proceed with the merger agreement entered into Aug. 27, 1934, but interrupted by the suit brought by the government Feb. 7, 1935.

Presumably, the department of justice will file an appeal which will further delay consummation of the merger. Accompanying the government's suit against the merger was an action against alleged interlocking directorates of certain middle western steel companies, which has not yet been decided.

To Republic's annual steel ingot capacity of 5,013,000 tons Corrigan will bring 1,000,000 tons. This however will not advance Republic beyond its present rating as the third largest producer of steel.

In the steel industry Friday the ruling of Judge Raymond, which is a remarkable document, was the more loudly acclaimed as a vindication of the industry and a rebuke to the Roosevelt administration because of the circumstances under which the action was instituted.

After Republic-Corrigan spent more than $1,000,000 in meeting the requirements of the securities control commission and compiling exhaustive data and apparently having conformed to every statistical demand of the government, the new dealers without any warning attacked the proposed merger.

Tom M. Girdler

Said Tom M. Girdler, chairman-president of Republic, and Donald B. Gillies, president of Corrigan, McKinney, following Judge Raymond's ruling: "Naturally we are deeply gratified at the favorable decision of Judge Raymond in our merger case. From the beginning we have had profound belief in the justice of our case and we used every effort to make a full and fair presentation of the facts at the trial. The case was ably tried on behalf of the department of justice and has been carefully considered by the court. It seems to us that Judge Raymond's opinion is so clear and complete as to leave nothing further to be desired."

Judge Raymond's decision, which is notable for its exposition of section 7 of the Clayton act, is substantially as follows:

Completion of the merger will not affect the relative position of the Republic Steel Corp. in the industry. The proposed merger appears to be warranted by sound economic considerations and the number and size of competing units disclose that the rival competing units outside the merger are of sufficient strength and activity to insure continuance of vigorous competitive conditions as to all commodities produced by the merging companies.

The record is voluminous, but in the view which the court takes of the issues involved, the foregoing statement is adequate. The fundamental and controlling differences relate to the proper construction of the provisions of section 7 relied upon by the government and to the deductions and inferences which may be fairly drawn from the evidence.

It is the claim of the government that substantial competition now exists among the several corporations whose stock would be acquired and the corporations making the acquisitions, and that the effect of these stock acquisitions may be to substantially lessen competition within the meaning of that portion of the Clayton act here invoked.

Government's Contention

As indicated, the government predicates its suit solely upon the first of three standards of effect of stock acquisitions which are within the condemnation of the section, and insists that to be entitled to the relief sought it is necessary to show merely that the effect may be to substantially lessen competition between the corporations acquiring the stock and the corporations whose stock is acquired.

It contends that if there is shown to now exist any substantial competition between Republic and Corrigan or others of the defendants, and that that competition would be eliminated or substantially lessened as the result of the stock acquisition, the merger is prohibited by section 7.

In short, it contends that because Corrigan contracts to dissolve within 30 days (thereby entirely eliminating it from the field of competition), the sole proper inquiry in this case is whether or not there now exists substantial competition between the corporations proposing to merge.

It argues that by the clause relied upon construed in the light of the authorities, congress has in effect declared that substantial lessening of competition and public injury are synonymous and urges that congress did not intend to submit the general question of public injury to the courts.

On the other hand, defendants insist that section 7 does not forbid mere acquisitions of assets and that therefore the acquisition for distribution to

its shareholders by Corrigan of Republic stock, and the acquisitions by Republic of Newton and Taylor stock, being incidental to a transaction whereby assets are acquired, are exempt from its provisions. They also urge . . . that the Clayton act does not forbid mere acquisition by one corporation of stock of a competitor even though it results in some lessening of competition; that the act deals only with such acquisitions as probably will result in lessening competition to a substantial degree, and that this means to such a degree as will injuriously affect the public.

The case turns upon the question of which of these conflicting views is correct. The undisputed facts and proper deductions therefrom entitled petitioner to the relief sought if the statutory provisions are to be construed as narrowly as contended by the government, and, as clearly, deny the right to remedial relief if the statute should be construed in conformity with defendants' contentions.

Public Interest Is Key

No authority is found whereby it is decided that that portion of section 7 relied upon by petitioner is applicable to contracts of merger regardless of the element of public interest. Cases involving other sections of the act lead to the conclusion that it is an important if not the controlling element. . .

Careful analysis of the foregoing and of other cases brings conviction that the courts have been unwilling to adopt a construction of the language used in section 7 which warrants an injunction against acquisition of stock in another corporation by one engaged in interstate commerce without affirmative showing of a probable effect to restrain commerce, create a monopoly or other injurious effect upon public interest. When a statute has been construed by the highest courts having jurisdiction to pass on it, such construction is as much a part of the statute as if plainly written into it originally.

But even if the interpretation of the language of section 7 were before the court without such authoritative construction, the result would not be different. The essential difference between lawful and unlawful acquisition of stock under the first sentence of section 7 lies in the *effect* of the transaction. The mere acquisition by one corporation of stock of another is not prohibited. The mere size of an organization, or the fact alone that a number of organizations have combined for the purpose of bettering the condition of the industry where the effect will probably not be to substantially lessen competition between the corporation whose stock is acquired and the corporation making the acquisition is not condemned.

Aim of Anti-trust Laws

The use of the word "substantial" implies a basis for comparison. The idea expressed varies greatly with the context and environment in which it is found. It may import negation of things merely illusive, seeming or imaginary, or, on the other hand, may exclude only that which does not fundamentally and materially influence a result. . . .

However inadequate or out-moded they may seem to be in the stress of the present economic situation, we must not overlook the fact that the dominating purpose of our anti-trust laws is to avoid undue concentration of commercial power; to preserve the principle of free, fair and open competition; to keep the door of opportunity open to small business; and to

(*Please turn to Page* 92)

Senate Resolution Extends NRA Ten Months; Hits Price Control

Washington

FOLLOWING action on the bonus bill, possibly this week and apparently certainly next week, the senate finance committee resolution to extend NRA until April 1, 1936, practically without price provisions and limited to interstate business, will come up for action in the senate.

Anything may happen, of course, but thus far the President and Donald R. Richberg, now chairman of the national industrial recovery board, have come off second best in their campaign to extend NRA for two years without change, and a favorable report by so powerful a body as the senate finance committee would seem to make the new resolution a good bet.

Under the amended provisions of NRA, regulation of prices under government control is limited to those "mineral natural-resource industries in which prices are now fixed pursuant to the provisions of any code."

Whether iron and steel could qualify depends upon the elasticity of governmental thinking. No definite statement has been made, but the intent would seem to include industries founded upon allegedly limited resources, such as manganese, rather than such an inclusive industry as iron and steel. Strictly speaking, of course, the present iron and steel price setup is open-price filing and not price fixing.

Advises Disregard NRA

The finance committee's favorable report on the resolution by Sen. Bennett Clark, of Missouri, followed a conference at the White House attended by Chairman Pat Harrison of the finance committee, Senators Borah, King and a few others who have opposed NRA. Immediately following this conference Senator Borah wired some of the small businesses in his state (Idaho) to disregard NRA if they carried on a purely intrastate business.

The legal concept of the iron and steel industry, such as was upheld in the Weirton Steel Co. labor decision in the recent decision by Judge Nields at Wilmington, Del., is that the actual production of iron and steel is intrastate, although the assembling of the raw materials and the sale of the finished products may be interstate. Thus the Clark resolution develops two uncertainties for iron and steel.

The exact wording of Senator Clark's resolution extending NRA to April 1 of next year is as follows:

(1) No price fixing shall be permitted or sanctioned under the provisions of any code; except that provisions for the regulation of prices under government control may be included in codes for those mineral natural-resource industries in which prices are now fixed pursuant to the provisions of any code and which the President finds to be so affected with a public interest that such regulation is necessary and proper in the public interest.

(2) No code of fair competition shall be applicable to any person whose business is wholly intrastate.

(3) The President shall review or cause to be reviewed for compliance with the requirements of this joint resolution every code in effect on the date this joint resolution takes effect. In order to afford reasonable opportunity for such review, such codes are hereby continued in effect (subject to cancellation or modification pursuant to the provisions of this joint resolution) for a period of 30 days after June 15, 1935, unless previously reviewed and superseded; but no code shall continue in effect after the expiration of such 30 days period unless the President has reviewed such code and has approved it and finds that the code in the form so approved conforms to the requirements of this joint resolution."

Substitute Bill Proposed

In the meantime, Senator King has introduced a bill in the upper house which is a substitute for the administration's NRA bill and in effect would make NRA a supplement to the federal trade commission act, following out and extending the present policy of the commission in dealing with unfair competition through trade practice conferences.

One section of the bill proposes to declare certain practices unfair methods of competition within the meaning of the trade commission act. These are in substance the so-called labor provisions of NRA and the Harrison bill, except that administration is lodged in the trade commission. Authority is given the commission to provide minimum wages and maximum hours for any trade or industry engaged in commerce.

Headed by William Green, president of the American Federation of Labor, the executive committee of the federation went to the White House Friday to oppose this ten-month extension of NRA. Speaker of the House Byrnes also protested the short extension.

William P. Witherow, steel man on the national industrial recovery board, defended NRA at the convention of the chamber of commerce of the United States, of which he remains a director. "A creature born in distress and reared in rush and disorder," he described NRA.

Steel in Black In First Quarter

THE steel industry went substantially into the profit area in the second quarter when strong showings by the National Steel Corp., Inland Steel Co., Republic Steel Corp., Otis Steel Co., Wheeling Steel Corp., and others handily wiped out deficits piled up by such large producers as the United States Steel Corp., Bethlehem Steel Co., Jones & Laughlin Steel Corp. and Youngstown Sheet & Tube Co.

Fourteen integrated producers, representing 58,000,000 tons of ingot capacity or 85 per cent of the country's total, show a net profit of $6,153,462 for the quarter. Assuming the experience of these 14 to be typical, the indicated net for the industry in the first quarter is $7,200,000. This contrasts with an indicated profit of $13,140,000 for the entire industry in all 1934. (See p. 30).

The profit makers for the first quarter reporting thus far include:

National	$3,367,632
Inland	2,465,796
Republic	1,834,235
Otis	952,362
Wheeling	934,571
Allegheny	324,146
Ludlum	230,157
Granite City	134,581
Colorado	51,490
Superior	38,511
Gulf States	30,149
Virginia Iron	8,950

The red ink contingent for the first quarter follows:

U. S. Steel	$2,173,801
J. & L.	794,789
Bethlehem	607,298
Sheet & Tube	595,769

STEEL CORP. STILL IN RED, BUT SHOWING IMPROVES

United States Steel Corp. in the first quarter ran up a deficit of $2,173,801, prior to payment of 50 cents on the preferred stock. This is a sharp reduction from the loss of $10,234,413 in the fourth quarter and $6,989,965 in the first quarter of 1934.

Net income of the Corporation was $1,033,269, after depletion, depreciation and obsolescence. But interest charges converted this into a deficit of $223,801, and proportion of overhead expenses of the Lake Superior iron ore properties increased the loss to $2,173,801.

Details of the Steel corporation's showing follow:

Earnings and income for the quarter after deducting all expenses, including ordinary repairs and maintenance, also estimated Federal, state and local taxes and reserves for contingencies (but exclusive of charge for proportion of overhead expenses and taxes shown below)		$12,428,449
Charges and allowances for depletion, depreciation and obsolescence,		11,395,180
Net Income		$ 1,033,269
Interest Charges on outstanding bonds and mortgages:		
Of subsidiary companies	$1,253,708	
Of United States Steel Corp.	3,362	
		1,257,070
Net deficit from operations		$ 223,801
Add, proportion of overhead expenses (of which taxes alone are $1,766,871) of Lake Superior iron properties and Great Lakes transportation service, normally included in the value of the season's production of ore carried in inventories, but which because of curtailment in tonnage of ore to be mined and shipped in 1935 is not so applied		1,950,000
		$ 2,173,801
Dividend for the quarter on stock of United States Steel Corp.: Preferred, ½%		1,801,405
Total deficit for the quarter provided from undivided surplus		$ 3,975,206

INLAND EARNINGS MORE THAN DOUBLE THOSE YEAR AGO

Inland Steel Co., Chicago, made a net profit of $2,465,796 in the first quarter, which compares with a net of $550,073 in the last quarter and $1,104,537 in the first quarter of 1934. A dividend of 50 cents payable June 1 to record of May 15 was declared. In the three preceding quarters payments of 25 cents have been made. Details of Inland's first quarter showing are:

Net income after deducting administration expense and all charges for repairs and maintenance		$4,103,378.78
Deduct:		
Interest on bonds	$445,500.00	
Depreciation and depletion	796,082.23	
Estimated federal taxes	396,000.00	1,637,582.23
Net profit for quarter		$2,465,796.55

NATIONAL'S PROFIT $3,367,632

National Steel Corp., Pittsburgh, profited to the extent of $3,367,632 in the first quarter, which is more than double the earnings of $1,467,825 in the last quarter of 1934. In the first quarter of 1934 National earned $1,642,328.

COLORADO BACK IN BLACK

Colorado Fuel & Iron Co., Denver and Pueblo, Colo., for the March quarter reports a net of $51,490, after all charges. Total income was $455,034, while bond interest was $55,770 and provision for depreciation of plants and exhaustion of minerals $347,773.

GRANITE CITY PROFIT $134,581

Granite City Steel Co., Granite City, Ill., reports net of $134,581, after all charges, in the first quarter, equal to 52 cents a share. A year ago it lost $18,441 in this quarter.

ALLEGHENY IN SLIGHT RISE

Allegheny Steel Co., Brackenridge, Pa., ran up a profit of $324,146 in the first quarter, which slightly exceeded the net of $293,954 in the opening quarter of 1934. A dividend of 25 cents on the common, payable June 12 to record of May 31, and the regular quarterly dividend of $1.75 on the preferred were declared.

INDUSTRIAL EQUIPMENT SALES PUT BLAW-KNOX IN BLACK

Increased sales of industrial equipment resulted in a profit for Blaw-Knox Co., Pittsburgh, in the first quarter compared with a loss last year, Irvin F. Lehman, president, stated last week. Net profits were approximately $142,000 after depreciation and estimated taxes, exclusive of foreign subsidiaries, compared with a loss of $5272 after depreciation and taxes in the corresponding three months of 1934.

ACME DOUBLES PROFIT

Acme Steel Co., Chicago, reports for first quarter net earnings of $601,990, compared with profit of $286,408 in the first quarter of 1934.

SUPERIOR NETS $38,511

Superior Steel Corp., Pittsburgh, reports net profit of $38,511, equal to 33 cents a share, in the first quarter, compared with net loss of $6266 in the first quarter of 1934.

OTIS SLIGHTLY BETTER

Otis Steel Co., Cleveland, showed a net of $952,362 for the first quarter, after charges, which is slightly larger than its profit of $652,889 a year ago.

Hook, Over Radio, Blasts Wagner Bill

THE most important problem before the country today is recovery, but the major retarding influence is political interference in the form of threats of additional burdens and restrictions through federal legislation, declared Charles R. Hook, president, the American Rolling Mill Co., Middletown, O., in an address over the radio Friday night.

The greatest sufferers from this political interference are employes themselves, and the most menacing proposal now before congress is the Wagner labor disputes bill, which is set up as an aid to labor, he maintained. The bill would place the federal government in the position of "dictating the most intimate relationships between employer and employes." Declared Mr. Hook:

"In the light of my own 35 years' experience in the steel industry, I am convinced that this bill would destroy the very thing it is declared to be its policy to accomplish, namely, to establish industrial peace and to diminish the causes of labor disputes."

Berger Steel-Frame House Project Initiated in Capital

A NEW type of modern house makes its national debut in Washington on May 6.

The entire skeleton or "carcass" of the house is of steel frames, which will be completely erected in two days or less. Prefabricated materials are utilized throughout the house.

Four weeks after the first bolt is tightened, the house—first of a number—will be finished and ready for occupancy.

The houses, developed by the Berger Mfg. Co., Canton, O., a subsidiary of Republic Steel Corp., being erected in Washington will be priced at $6950. This includes not only the house itself, but also the lot, landscaping, sewer and water connections, sidewalks, drives—in fact the complete property.

The moderate cost of the house is due to wide use of the plant-fabricated materials which have been developed during the past several years by building material manufacturers.

The house will be built of strip steel frame units and finished with common brick. Any type of ordinary building material, however, such as brick, lumber, stucco or stone, can be used.

Market for Strip Mill Tonnage

The silver-white aluminum-painted steel units also are adaptable to any architectural style or floor plan.

This new house development has been designed to meet the demand for moderate-priced homes created by the virtual stoppage of residential building. It is estimated that this demand is for 1,500,000 homes.

The steel-frame house will be a boon to the steel industry, furnishing a new outlet for steel. Each house will use approximately four tons.

The Berloy houses, as they are called, are modern in design and appearance and are the creation of Kastner & Stonorov, technical consultants for the Berger company, who recently designed a 280-apartment development in Philadelphia, the first limited dividend corporation housing project completed under PWA.

The steel wall frame units for the houses are rectangles, three feet wide, and of desired ceiling height. Steel window and door frames are shop welded into rectangles of the same size, making all frames interchangeable.

The frames are bolted to the foundation and to each other, and steel floor and roof joists bolted to the rectangular wall frames, making a complete, rigid steel skeleton for the entire house. The entire house is encased in 1-inch sheathing of cork before the exterior finish is applied—insuring complete insulation.

The houses are being built by Carr Bros., well-known Washington contractors and builders of homes.

In keeping with modern architecture, roofs of these houses are flat and basements have been eliminated. The houses can be built with a basement and any type of roof. The exterior will be white painted brick with stucco front entry and porch. Room arrangement eliminates all waste space and reduces housekeeping to a minimum.

Pipes in Central Duct

One of the ingenious features of the house is a plumbing stack or chase, a self-contained box-like unit containing all water pipes, vents and flues, which serves both the kitchen and bath and becomes an integral part of the house wall.

All kitchen equipment is placed along one wall. A gas heated air-conditioning unit is at one end, followed by a gas range, laundry tub, sink, and mechanical refigerator, all of which are of table height and can be used as a continuous working surface. A steel broom closet is also included in the layout.

Hot or cool air, depending on the season, is circulated throughout the house in ducts built into the steel frames. Used air is withdrawn into inconspicuous, attractive grilles and carried through the walls, floors and ceilings of the house, insuring even temperature.

The kitchen is 9 x 12 feet with composition floor.

The 12 x 21-foot living room has four steel casement windows. This type of window is used throughout the house. In all the rooms except the bath and two large bedrooms the windows are 4 feet high.

The dining room is 12 x 12 feet, and has four windows.

There are three large bedrooms on the second floor and a smaller room which may be used for storage or for a nursery. The bath room is complete with combination tub and shower. There is also a 9 x 15-foot covered porch enclosed on three sides, and a single car garage.

Steel Used Where Advantageous

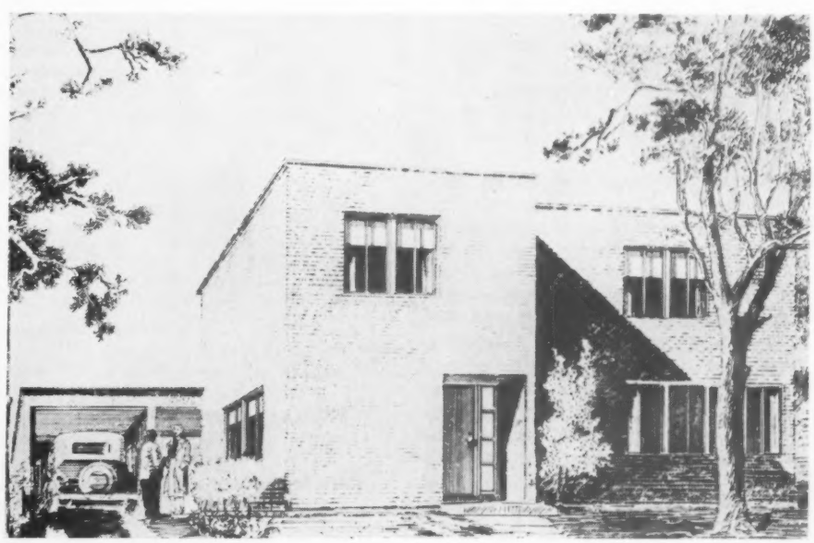
The floor plan used here, with slight modification, has been adapted to French, New England colonial, western colonial and Georgian designs.

"We believe," says L. S. Hamaker, vice president and general manager of the Berger company, "that a fireproof house of this type utilizing steel where steel is important from an economic and safety standpoint, and other building materials where they are most appropriate and attractive, is an important contribution to the solution of the home shortage problem.

"FHA mortgage insurance facilities will greatly stimulate the demand for this and other types of houses. This type of construction was carefully investigated and approved by FHA engineers.

"It is our belief that these houses will be erected throughout the country in sufficient number to furnish wide employment to building trades mechanics and bring greatly increased business to the producers and distributors of all building materials."

The Berloy steel-frame houses will be marketed through regular building material distributors.



Pig Iron Rate Down Again in April; Stack Total Unchanged

WITH a total of 1,671,556 gross tons and an average daily rate of 55,719 tons, production of coke pig iron in the United States in April suffered a set-back for the second consecutive month. The daily rate of March had dropped only slightly below February, while total production had made a substantial gain. It is encouraging to note, however, that there has been no recession in the number of operating blast furnaces; both April and March came to a close with 97 stacks making iron.

The average daily production of 55,719 tons in April was a loss of 1401 tons, or 2.46 per cent, from the 57,120-ton rate of March. This rate is still well above the January rate of 47,692 tons. In April, 1934, the average daily rate was 57,873 tons.

Compared with the 1,770,990 tons made in March, the 1,671,556-ton total output of April was a decrease of 99,434 tons, or 5.6 per cent. April was a one-day shorter month than March. The March total had gained 156,085 tons, or 9.6 per cent over February which was only a 28-day month. Total production in April, one year ago, was 1,736,217 tons.

For the first four months of 1935, production has aggregated 6,535,894 gross tons and this exceeds the figure for the corresponding period of 1934 by 677,654 tons, or 11.5 per cent. In the first four months of 1933, production amounted to only 2,287,471 tons.

Relating production to capacity, April had an operating rate of 40.0 per cent, compared with 41.0 per cent in March, 41.4 per cent in February and 34.2 per cent in January. The rate in April, a year ago, was 41.4 per cent.

The 97 blast furnaces producing iron on April 30 was the largest number operating since May, 1934, with a total of 117. In April, 1934, the total was 109.

During the month, 5 furnaces resumed and 5 were blown out or banked. All were of the nonmerchant or steelworks classification; no changes being made in merchant units.

Blast furnaces resuming in April were: In Ohio: Mingo No. 2, Carnegie Steel Co. In Pennsylvania: National No. 1, National Tube Co.; one Aliquippa, Jones & Laughlin Steel Corp.; one Swede, Alan Wood Steel Co. In New York: Buffalo No. 2, National Steel Corp.

Furnaces blown out or banked were: In Ohio: Campbell A, Youngstown Sheet & Tube Co. In Pennsylvania: Cambria E and J, Bethlehem Steel Co. In Michigan, Detroit B, National Steel Corp. In Alabama: Fairfield No. 6, Tennessee Coal, Iron & Railroad Co.

With the Tennessee Coal, Iron & Railroad Co. having dismantled its two Bessemer stacks at Bessemer, Ala., the number of potential blast furnaces in the United States is reduced from 280 to 278. These two furnaces, Nos. 3 and 4, were built in 1889-90 and had an annual capacity of 126,390 tons of basic, foundry and recarburizing pig iron. The company at one time had five furnaces at the Bessemer plant, but No. 5 was dismantled in 1927 and Nos. 1 and 2 in 1929.

MONTHLY IRON PRODUCTION

Gross Tons

	1935	1934	1933
Jan.	1,478,443	1,225,643	568,785
Feb.	1,614,905	1,270,792	553,067
Mar.	1,770,990	1,625,588	542,013
Apr.	1,671,556	1,736,217	623,606
Tot. 4 mo.	6,535,894	5,858,240	2,287,471
May		2,057,471	892,326
June		1,936,897	1,264,953
July		1,228,544	1,801,345
Aug.		1,060,187	1,833,265
Sept.		899,075	1,507,931
Oct.		951,353	1,358,540
Nov.		957,906	1,083,740
Dec.		1,028,006	1,192,136
Total		15,977,679	13,221,707

AVERAGE DAILY PRODUCTION

Gross Tons

	1935	1934	1933	1932
Jan.	47,692	39,537	18,348	31,336
Feb.	57,675	45,385	19,752	33,122
Mar.	57,120	52,438	17,484	31,194
Apr.	55,719	57,873	20,786	28,524
May		66,370	28,784	25,282
June		64.563	42,165	20,867
July		39,630	58,108	18,394
Aug.		34,199	59,137	17,035
Sept.		29,969	50,264	19,788
Oct.		30,689	43.824	20,795
Nov.		31,930	36,124	20,858
Dec.		33,161	38,456	17,650
Ave.	54,048	43,774	36,223	23,699

APRIL IRON PRODUCTION

	No. in blast last day of Apr.	No. in blast last day of Mar.	Total tonnage Merchant	Total tonnage Nonmerchant
Ohio	25	25	66,718	397,953
Penna.	29	28	45,591*	364,128*
Alabama	8	9	56,702	66,204
Illinois	8	8	33,270	128,309
New York	7	6	59,729	52,118
Colorado	1	1		
Indiana	8	8	3,781*	266,987
Maryland	3	3		
Virginia	1	1		
Kentucky	1	1		
Mass.	0	0		
Tennessee	0	0		
Utah	1	1	7,997	122,069
West Va.	3	3		
Michigan	2	3		
Minnesota	0	0		
Missouri	0	0		
Total	97	97	273,788*	1,397,768*

*Includes ferro and spiegeleisen.

RATE OF OPERATION

(Relation of Production to Capacity)

	1935[1]	1934[2]	1933[3]	1932[4]
Jan.	34.2	28.3	13.3	22.1
Feb.	41.4	32.5	14.3	23.4
Mar.	41.0	37.5	12.7	22.0
Apr.	40.0	41.4	15.1	20.2
May		47.5	20.9	17.9
June		46.3	30.6	14.7
July		28.4	42.4	13.0
Aug.		24.5	42.8	12.0
Sept.		21.5	36.4	14.0
Oct.		22.1	31.8	14.7
Nov.		22.8	26.2	14.7
Dec.		23.7	27.9	12.5

[1]Based on capacity of 50,845,741 gross tons, Dec. 31, 1934; [2]capacity of 50,975,561 tons, Dec. 31, 1933; [3]capacity of 50,313,975 tons, Dec. 31, 1932; [4]capacity of 51,598,175 tons, Dec. 31, 1931. Capacities by American Iron and Steel institute.

Steel in the News

FIFTY THOUSAND dollars worth of radium last week was shipped from Los Angeles to Boulder City, Nev., to be used in inspecting welds in the steel pipe which will carry water impounded by the dam to the main penstock header to the power plant.

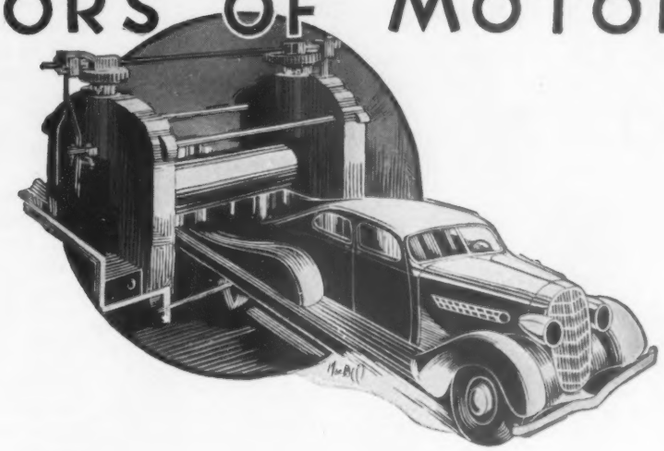
AFTER STEEL CORP. TAXES?

Municipality of Sharon, Pa., has been attempting to annex the nearby town of Farrell, Pa., by invoking legislation some 30 years old. These two steel centers, however, have failed to join hands sympathetically and Farrell officials last week opened war against the consolidation move, charging that Sharon wanted Farrell for the taxes received from subsidiary companies of the United States Steel Corp.

Gets Sheet Mill Motors

Allis-Chalmers Mfg. Co., West Allis, Wis., has booked an order for electrical equipment for the new wide sheet-strip mill of the American Sheet & Tin Plate Co., at Gary, Ind. The order is valued at $1,000,000.

MIRRORS OF MOTORDOM



DETROIT, Friday

WHILE General Motors last week was observing the amenities of the labor situation by conferring with representatives of organized groups at its plants where the pot was boiling, it was also taking practical steps to bypass the shutdown of the Chevrolet-Pontiac transmission plant at Toledo.

Carloads of machinery, estimated to have cost upward of $1,000,000, were moving into Muncie, where the former Warner Gear works, closed in 1932 to permit more economical, concentrated production at Flint and Lansing, was being rehabilitated. Part of the Buick plant at Flint was being shifted over to the manufacture of Pontiac transmissions.

In order not to fan the flames, General Motors last week was not openly discussing its plans or conceding that it was re-equipping Muncie. There were rumors that many carloads of machinery were being shipped out of the Toledo transmission plant, but unofficially it was said that no such incendiary step was being taken. What the future holds for Toledo is another matter, of course.

WAIT FOR SHOWDOWN?

At the close of last week it was also being rumored that if the labor situation did not quiet shortly, all General Motors plants—perhaps the entire automobile industry except Ford—would shut down until organized labor and Washington stopped sniping and trying to hamstring the one major industry that has regained 1929 volume and has contributed the most to recovery.

It is inexplicable in Detroit why the new deal continues to give comfort to the enemies of the industry. As pointed out last week by the Automobile Manufacturers' association, automobile labor is now being paid the highest hourly rates in history and the labor cost per car is greater than in 1929. The fact that weekly wages in the year ended with March were only $24.70 instead of $32.74 as in 1929 is caused entirely by the NRA restriction of the work week to 40 hours.

Meanwhile, with parleys proceeding in Detroit and machinery being feverishly installed at Muncie (Syracuse was anxiously watching for signs of life at the old Brown-Lipe plant), the steel and parts industries were feeling the backwash of the Chevrolet shutdown at Toledo. As banks of transmission began to dwindle assemblies were curtailed and some branch plants went down entirely. The result was suspensions and holdups affecting practically every part and material supplier.

CLOSED SHOP IS OUT

Should efforts to bridge the difficulty at Toledo succeed over the week-end, holdup orders for steel would be promptly canceled. If the resumption of Chevrolet assembling hinges on transmissions from the Muncie plant, then a week or ten days will elapse, at least, before volume releases are issued.

Practically, the only real issue is the closed shop. It has never been said in so many words by a responsible General Motors executive, but when Alfred P. Sloan Jr. and W. S. Knudsen agree to a closed union shop for General Motors there will not be any automobile industry. So far as hours or wages or working conditions or recognition of organized groups are concerned, there is no dispute.

Another matter concerning which General Motors, for obvious reasons, does not openly discuss is the situation in Cleveland and Toledo regarding police protection. In both cities any safeguards to loyal employes are nil. Fisher Body can now make Chevrolet turret tops in Detroit and Pontiac as well as Cleveland, and any further serious trouble in Cleveland will result in locking the doors there for good. If the Toledo transmission strike can be settled reasonably General Motors will not spite itself by leaving the town flat, but never again will it be caught in such a bottleneck.

From its standpoint, organized labor has done a smart thing by capitalizing the strike at Toledo. The Fisher Body plant at Cleveland and the Chevrolet assembly plant at Norwood (Cincinnati) would have had to close anyway on account of a lack of transmissions for Chevrolet assembling. But labor has seized the opportunity to walk out and give the impression that its strength effected the closing.

It may be that Toledo will be the Serajevo of the automobile industry and set the industry aflame, but the soundest opinion in Detroit is that it will not. Automobile labor cares no more for the American Federation of Labor or any other organization than it does for so-called representation plans. It is highly individualistic, suspicious of organizers, desirous of working and earning. The only unknown quantity is the extent to which aggressive minorities, with the blessing of the new deal, can be effective.

ADD INSULT TO INJURY

Reverting to the automobile industry's attitude toward Washington, the feeling that the administration has incited labor to rebel at this time, when the industry is operating at late 1929 levels, is not the only sore spot. It is bad enough to mar the picture, presented in this department in the April 22 issue, of bustling activity, reminiscent of 1929.

But AAA Administrator Davis has proposed that exports of automobiles be curbed in order to compel world buyers to divert the same money to American cotton and other agricultural products. Normally Mr. Sloan is a calm man, but he displays fire which Detroit acclaims in this comeback to Mr. Davis:

"What is being suggested is nothing

more or less than to regulate out of the world markets American motor cars that represent American labor, American material, even a certain amount of American cotton itself, and try to substitute more cotton that we cannot sell at the price we must ask.

"I make these observations in the hope of discouraging what will turn out to be another excursion into economic wonderland, and in behalf of the automotive industry as well as of national recovery in both of which I am profoundly interested."

CLOSING of some Chevrolet assembly plants came too late last week to affect the general automobile production situation seriously. Cram's compilation places assemblies in the week ended Saturday at 110,896, compared with 110,970 in the week ended April 27.

At about 28,000 units assembled last week, Chevrolet was off fractionally. The current week, however, will feel the first full impact of the Toledo strike. What makes Chevrolet feel particularly bad is that the strike further handicaps its attempt to overtake Ford. For the year to date Ford has assembled about 550,000 units. Chevrolet's total is slightly over 375,000.

NEW CHEVROLET IN FALL?

Rounding the first third of the year with Ford having a lead of almost 175,000 units, Chevrolet is up against a stiff struggle. Last year Chevrolet topped Ford by 534,906 units to 530,528, but it then had the advantage of selling cars to the government to the exclusion of Ford.

A further handicap to Chevrolet dealers has been the lack of radical exterior changes in the current Chevrolet. The buying public has come to demand sparkling new lines each year, something that will sharply differentiate new cars from old.

There is considerable comment that the 1935 Chevrolet is rather conservative. This leads to some speculation whether there may be a radically-changed Chevrolet, with hydraulic brakes, in the late summer or early fall when the introduction of a 1936 series will be sanctioned by the automobile code.

Ford production last week slightly topped 40,000, or practically 6700 units a day, six days a week. Over the past 30 days Ford has let some contracts calculated to minimize the drumming noise set up inside bodies as a result both of the extreme curved roof and of moving the engine forward, thus increasing the driveshaft 8½ inches. The entire floor pan is being felted and a special preparation is being applied to the interior around the rear window and at the curve of the roof.

Ford last week also let the contract for two batteries of by-product coke ovens, totaling 122 units, replacing half of the present 240 units. The total expenditure for the coke plant is $4,000,000, and the order for ovens may be doubled.

Speaking of improvements, the plan of the Great Lakes Steel Corp. division of the National Steel Corp., to add a wide strip-sheet mill at Ecorse presents unusual problems. Part of the site of the new mill is under water, a 15-foot fill will be necessary and about 18,000 concrete piles will have to be driven. The Great Lakes' site along side the Detroit river is an extremely valuable one. It appears to be cheaper to make land than to buy it.

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1933	1934	1935
Jan.	128,825	155,666	292,765
Feb.	105,447	230,256	340,544
Mar.	115,272	338,434	429,830
Apr.	176,432	352,975	*475,000
4 mo.	525,976	1,077,331	*1,538,139
May	214,411	330,455	
June	249,727	306,477	
July	229,357	264,933	
Aug.	232,855	234,811	
Sept.	191,800	170,007	
Oct.	134,683	131,991	
Nov.	60,683	83,482	
Dec.	80,565	153,624	
Year	1,920,057	2,753,111	

*Estimated.

Estimated by *Cram's Reports*

Week ended:

April 27	110,970
May 4	110,865

CHRYSLER SHOWING SPARKLES

Chrysler units last week continued unchanged at a total of 19,975, breaking down into 6950 Dodges, 1275 Chryslers, 1200 DeSotos and 10,550 Plymouths. Chrysler operations the first quarter have been so profitable, returning a net of $9,163,182, that an extra dividend of 25 cents has been declared.

General Motors' output, aggregating just under 40,000 units, includes 4650 Oldsmobiles, 4400 Pontiacs, 1700 Buicks, and 700 Cadillac-LaSalles in addition to about 28,000 Chevrolets.

Other production totals for last week include 200 Auburns, 550 Grahams, 400 Hupps, 1700 Nashes, 1300 Studebakers, 2800 Hudson-Terraplanes, 1500 Packards, 55 Lincolns.

Detroit hears that the new medium-price Lincoln will be called the Edison (Henry Ford was long a close friend of Thomas Edison) and will have an all-steel top. Briggs is doing the preliminary work on this top. Considering that Ford will have the capacity for making the necessary wide sheets in his new continuous strip-sheet mill, it seems logical to expect that Fords next year also will be equipped with an all-steel top.

Experimental work on such a top has already been done at the Rouge plant, as well as by Briggs, Murray and other Ford body makers.

WHEN the fine old family in the mansion next door comes on evil days, grows impoverished and starts quarreling within itself, it is a sad scene and you do the decent thing of closing your windows in order not to witness the scene.

For this reason this department has avoided retailing the details of the internal strife that has wracked Hupp recently, but there are certain aspects, including historical ones, that are of marked interest to the steel and parts industries.

One important issue within Hupp has been a front wheel drive car. Arch M. Andrews, the present chairman and largest stockholder of Hupp, it will be recalled, at one time was associated with the Ruxton front wheel drive car and is understood to own the patents. He has advocated a front drive Hupp, which has been designed and for which experimental parts were built. It is not known that Hupp contemplates bringing out such a type car now, but the sponsorship is there.

It is not generally known, but a former management of Hupp visualized its becoming a second General Motors. That was the reason for acquiring the Chandler and Cleveland plants in Cleveland and the program once was so ambitious it included Rolls Royce of England.

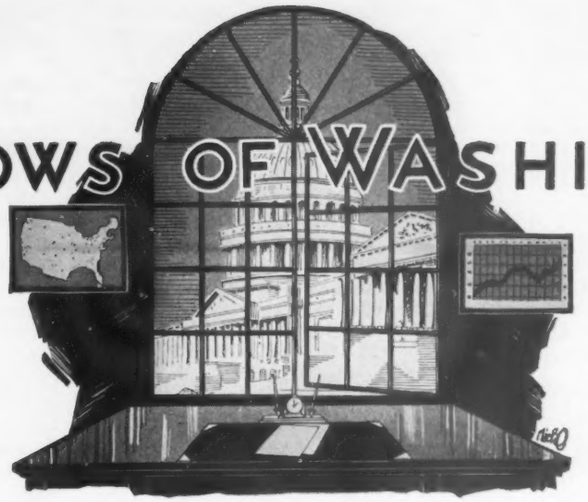
When the depression started, in 1930, Hupp had current assets of $16,000,000, including $3,700,000 in cash and $6,200,000 in government securities. Its surplus was $13,800,000. Now it operates day to day.

ROAD COULD BE CLEARED

To break even, Hupp needs to make about 2000 units a month. April production was about 1200 units. Unfilled orders carried over into May exceeded 2000. With a cessation of internal dissension, the placing of representatives of suppliers on the board of directors for purposes of credit, and a good advertising campaign, Hupp would be on its way.

At various times Hupp has been mentioned in connection with a merger which would include Packard, Hudson and Studebaker. Packard is having a splendid run on its new low-price line. Hudson has just completed the best quarter, from the standpoint of profit, in four years. Studebaker has emerged impressively from its reorganization. Hupp would contribute a fine old name, if such a merger were ever consummated.

WINDOWS OF WASHINGTON



WASHINGTON

SPENDING under the new four billion dollar work-relief law is proceeding slowly. Up to the time this is written, some appropriations out of the fund have been made for CCC and some for FERA, but aside from that apparently nothing has been done, and even organization and administrative work is going ahead slowly—and thereby hangs this tale:

> The President is much impressed with the fact that business in the United States is on the upgrade. Some of his best friends have stated that he is going slowly because he feels that he might not spend as much money as has been appropriated, and that in 1936 he could go before the electorate showing how little money was actually spent—how much he had saved the country—and this would be far better for re-election than the four billion dollar fund because it would appeal to more people as being American and common sense. In other words, the whisperings are to the effect that he will hold back on these huge expenditures if he can.

Nonfederal Projects Up

In the meantime, Public Works Administrator Ickes has directed PWA state engineers to receive new applications for nonfederal public works projects.

Applications are to be received at once for loans and grants, loans only and grants only, and on the same basis as heretofore, the terms and conditions to be subject to revision when new regulations are announced.

Bearing in mind that it is expected that $300,000,000 will still be allocated out of the four billion relief work program for grade crossings and the same amount for highways, the steel industry will be much interested in some accurate figures which have just been filed by state highway commissions with the American Association of State Highway Officials.

The state officials now have ready to "shoot" grade crossing projects numbering 1756, which would cost $184,314,000. The projects could be under contract inside of three months, it is estimated, and inside of one year these same commissions could have 2302 grade crossing projects costing $277,567,000 under way in full swing. This is about the amount which will be allocated for that purpose. Steel representatives in this city estimate that taking the grade crossings as a whole, both underground and overhead, that about 10 tons of steel would be needed per crossing.

The same highway officials have estimated that they could have 161 projects ready to go ahead inside of three months for elimination of congested and dangerous highway intersections, to cost $20,240,000, while inside of a year they could have 182 such projects under way, to cost $27,312,000.

It is also estimated that inside of three months 4645 jobs of construction and reconstruction of highways could be under way to cost $332,153,000, which is expected is about the amount the President will allocate for this purpose.

The state highway officials also have shown that 2285 projects of weak and narrow bridges could be under way, costing $86,457,000, in three months while 621 projects costing $72,530,000 could be under way in three months for the construction and reconstruction of trunk line routes through cities and by-passes.

The President said Friday first meeting of the allotment board will be held Tuesday.

FTC DOING FIELD WORK ON FABRICATORS' COMPLAINT

It will be two or three weeks before the field work has been completed by experts of the federal trade commission in connection with the investigation it is making on the relations between steel producers and structural steel fabricators dealing with competition between mill fabricators and independent fabricators.

The complaint in this case was filed with the commission by the Central Fabricators' association.

As in the case of all so-called informal complaints, such as this is, officials of the commission refuse to discuss the matter. Following the preliminary investigation, if the commission feels that a case can be made, it will issue a formal complaint and the case will be public. On the other hand, if the field investigations do not show that a case can be made, nothing further will be heard about it.

STEEL MEN URGE HOUSING

V. Gilmore Iden, of the American Institute of Steel Construction, and Harry F. Knapp, of the Carnegie Steel Co., represented the steel industry at a conference held here with building industry representatives.

At this conference, attended also by representatives of the federal housing administration, a resolution was passed calling for the immediate creation of a mortgage association with a substantial capital by the Reconstruction Finance Corp. for the purpose of stimulating more general interest on the part of the banks of the country in the making of loans under Title II of the national housing act.

PRESIDENT MUM ON COAL BILL; OPPOSITION IS GROWING

At a press conference last week the President again refused to be pinned down to any opinion on the Guffey bituminous coal bill. He did state that the NRA code has brought the industry where production and consumption are nearly on a level, which he said was necessary because of the need for steady employment.

At the same time, coal operators

representing approximately 60 per cent of the bituminous tonnage produced in the United States have just laid plans for concerted action to oppose the Guffey bill, which proposes special governmental regulation of the industry.

The decision to fight the bill was reached at a meeting held here the latter part of last week and attended by producers from nearly every coal mining state. It was stated at the conference that practically the entire South and West are opposed to the measure and the opposition is also strong in many parts of the North.

HULL SEEKS TRADE PACT WITH FRANCE; LITTLE IRON, STEEL

Secretary of State Hull has announced his intention of negotiating a trade agreement with France. Hearing on the subject will be held by the committee for reciprocity information, June 24. No great quantity of iron and steel articles is either imported from or exported to France by the United States.

Statistics made public by the state department show that in 1929 the United States exported to France 34,103,513 pounds of black steel sheets valued at $1,834,410, dropping in 1934 to 3,738,720 pounds valued at $154,428. Also in 1929, this country exported 1,944,154 pounds of iron and steel castings and forgings valued at $295,694 falling off in 1934 to 282,141 pounds valued at $44,112. "Other iron and steel manufactures" exported in 1929 were valued at $945,973, falling off in 1934 to $446,191.

RAILROADS IN 1934 TRIPLE PURCHASES OF IRON, STEEL

The railroads bought $159,758,000 worth of iron and steel products during 1934, according to the bureau of railway economics, Washington, an increase of $49,038,000 over 1933.

For new and second hand rails, the railroads in 1934 paid $31,107,000, while in 1933 the corresponding amount was $11,835,000.

For track materials such as fastenings, bolts, spikes, tie plates, rail anchors, frogs, switches and crossings, the railroads expended $31,283,000 in 1934, and $16,691,000 in 1933.

They also purchased locomotive and car castings, beams, couplers, frames and car roofs costing $24,583,000, compared with $18,562,000 in 1933.

Contests

JEROME RAPHAEL, a student at Massachusetts Institute of Technology, won first prize in the seventh annual bridge design competition held by the American Institute of Steel Construction, New York.

Alexander Matthews Jr., a student at the Yale School of Engineering, won second prize. First honorable mention was given to David Hiat, of New York university, and second honorable mention to Fred A. Thompson Jr., of Iowa State college.

The problem was to design a steel grade crossing elimination bridge carrying a highway over a railroad and another highway parallel to the railroad. In addition to giving the students certificates of award, the first prize carries a cash compensation of $100 and the second prize $50.

Transportation

SELLERS of finished iron and steel are to be saved considerable effort in computing the new surcharges on carload shipments by schedules just approved by the carriers. Instead of having to carry their figures out several decimal points, as would have been the case in many instances, and of having to make a separate calculation for each rate, they now find their computations may be limited to no more than three decimals and to groups of rates. They were effective May 4.

Under the new schedule, all rates from 3 to 10 cents per 100 pounds, inclusive, take a flat increase of ½ cent; from 10½ to 20 cents, an increase of 1 cent; 20½ to 28, an increase of 1½ cents; and on rates of 28½ cents and over, 2 cents.

This schedule, however, does not apply to pig iron, semifinished steel and other materials figured on a gross-ton basis, which will continue to be figured out to the full number of decimals.

Pennsylvania intrastate rates were increased May 6 to include the new surcharge, with a result that delivered Philadelphia prices on sheets, strip and bars among certain of the leading products have been advanced 2 cents per 100 pounds.

Prices on No. 2 foundry, malleable and basic pig iron have been advanced 5.32 cents, delivered, Philadelphia. By-product coke has been increased 3 cents to $9.03, delivered, Philadelphia, per net ton.

The base on ferromanganese for delivery at Pittsburgh has been shunted from Philadelphia to Baltimore as a result of the advance in Pennsylvania intrastate rates.

FORM UPPER OHIO VALLEY GROUP TO COMBAT CANAL

An organization known as the Upper Ohio Valley association, 2220 Koppers building, Pittsburgh, was organized last week at a meeting of nearly 50 railroad men and industrialists in the Ohio-Allegheny-Monongahela river district, including iron and steel representatives to "acquaint the public with the facts concerning the projected Beaver-Struthers canal" which would give the Youngstown district a water outlet to the Ohio river.

According to the association, the canal would have a first cost of $73,000,000, only two large steel companies in the Youngstown district would gain a substantial advantage, and only one of these is located directly on the proposed waterway and western Pennsylvania industry would suffer disproportionately to the cost.

Heading the Upper Ohio Valley association is Frank J. Lanahan, president, Fort Pitt Malleable Iron Co., Pittsburgh. Steel men on the board include J. M. Gillespie, president, Lockhart Iron & Steel Co.; E. L. Parker, president, Columbia Steel & Shafting Co.; and Arthur C. Townsend, of the Townsend Co. Carlton G. Ketchum is executive director.

The Jones & Laughlin Steel Corp. last week issued a statement decrying the project "as a half job and of sectional advantage."

Labor

STRIKE at the Newton Steel Co. plant at Monroe, Mich., was settled Friday, it was announced by the national steel labor relations board. Work will probably be resumed this week. Recent repairs at the Newton Falls, O., plant of the Newton company are for maintenance purposes and do not indicate any nearby resumption there.

AMALGAMATED PLANS MEMBERS DRIVE; REBELS STILL OUT

Amalgamated Association of Iron, Steel and Tin Workers Friday closed its convention, in session at Pittsburgh since April 23. It selected Canonsburg, Pa., for the 1936 meeting. Plans for a membership drive were approved tentatively, hinging upon an American Federation of Labor conference probably next week.

Rank and file rebels, expelled from the convention and denied an injunction in the Pittsburgh courts, last week carried their troubles to A. F. of L. headquarters in Washington, only to be informed that the federation cannot recognize any group opposing the Amalgamated. Efforts to heal the breach are being continued.

Institute

PROGRAM for the forty-fourth general meeting of the American Iron and Steel institute, to be held at the Hotel Commodore, Thursday, May 23, will be opened by an address by Eugene G. Grace, president of the Institute and president of the Bethlehem Steel Corp. The morning session is scheduled to begin at 10.

Other speakers at this session will

be Charles M. Schwab, former head of the Institute, for many years, and chairman of Bethlehem; T. M. Girdler, chairman of Republic Steel Corp., Cleveland, who will speak on "The Outlook for Steel"; William A. Irvin, president, United States Steel Corp., whose paper will be entitled "A Review of the Year"; E. T. Weir, chairman, National Steel Corp., Pittsburgh, who will speak on "Progress in Labor Relations"; and Walter S. Tower, executive secretary of the Institute, who will report on Institute activities.

Speakers at the afternoon session, scheduled to begin at 2 o'clock, will be C. J. Whetzel, assistant to the vice president, American Sheet & Tin Plate Co., Pittsburgh, who will present a paper entitled "Modern Steels and Weight Reduction"; S. M. Weckstein, assistant chief engineer, Timken Steel & Tube Co., Canton, O., "Precision Mills for Rolling Strip, Bars and Rods"; and D. M. Petty, superintendent of service division, Bethlehem Steel Co., Bethlehem, Pa., "The Economic Importance of the Replacement of Obsolete Equipment in Steel Mills."

Speakers for the banquet to be held that evening in the Grand ballroom of the hotel and scheduled for 7:30 p.m., will be announced later in these pages.

UNITED STATES IMPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

Commodity	March, 1935	Feb., 1935	Jan. thru March, 1935
Pig iron	2,708	10,741	15,482
Sponge iron	51	.....	308
Ferromanganese, spiegeleisen (1)	2,800	2,749	8,179
Ferrochrome (2)	1	.....	1
Ferrosilicon (3)	60	88	361
Other ferroalloys (4)	.....	.....	1
Scrap	2,352	2,790	7,557
Steel ingots, blooms, etc.	56	467	622
Concrete bars	92	.....	201
Hollow bar, drill steel	50	55	155
Merchant steel bars	1,442	1,604	5,256
Iron slabs	.....	.....	.....
Iron bars	39	119	216
Wire rods	1,881	952	3,608
Boiler and other plate	7	19	36
Sheets, skelp, saw plate	422	546	1,289
Tin plate	32	10	46
Structural shapes	1,719	1,885	7,173
Sheet piling	.....	.....	.....
Rails and fastenings	3	407	621
Cast iron pipe, fittings	.....	.....	.....
Malleable iron pipe fittings (5)	9	.....	46
Welded pipe	143	132	296
Other pipe	293	1,247	3,209
Barbed wire	3,364	2,217	2,265
Round iron, steel wire	330	224	969
Telegraph, telephone wire	4	.....	4
Flat wire, strip steel	152	103	367
Wire rope and strand	204	113	510
Other wire	70	67	283
Cotton ties (5)	177	12	269
Other hoops, bands	1,349	1,234	4,790
Nails, tacks, staples	1,339	966	3,298
Bolts, nuts, rivets	28	22	86
Horse and mule shoes	96	42	220
Castings and forgings	136	94	374
Total gross tons	21,409	28,905	73,098

(1) Manganese content.
(2) Chrome content.
(3) Silicon content.
(4) Alloy content.
(5) New class. No comparable figures for 1934 and previous years.

March Exports in New High Record

SETTING at least a modern and possibly an all-time record, exports of steel and iron products in March reached a total of 323,035 tons, which is 94,498 tons over February, a gain of 41.3 per cent, and 61,766 tons higher than in March, 1934.

While steel and iron scrap set a new record with total shipments of 228,338 gross tons, slightly more than was exported in the entire year 1932, thus contributing greatly to the record total, other items also increased and exports aside from scrap showed an increase of 17,888 tons in March over February.

Exports for first quarter, 1935, totaled 814,312 gross tons, a gain of 223,836 tons over first quarter of 1934. Should this rate continue through the year export trade would total more than 3,250,000 tons.

Imports in March declined to 21,409 gross tons, 26 per cent lower than in February, a loss of 7496 tons. For first quarter of 1935 imports totaled 73,098 tons, about 85 per cent of the total for first quarter of 1934. Smaller imports of pig iron is the major cause of this decline.

Of the 228,338 gross tons of scrap exported Japan took 160,475 tons, Italy 27,783 tons, and the United Kingdom 20,224 tons. Figures are by the iron and steel division of the department of commerce.

FOREIGN TRADE OF UNITED STATES IN IRON AND STEEL

Gross Tons

	1935 Imports	1935 Exports	1934 Imports	1934 Exports
Jan.	22,784	262,740	22,653	178,023
Feb.	28,905	228,537	25,407	151,184
Mar.	21,409	323,035	38,393	261,269
3 mo.	73,098	814,312	86,430	590,476
April	.....	.....	26,862	201,539
May	.....	.....	29,465	241,753
June	.....	.....	24,848	219,406
July	.....	.....	17,676	233,186
Aug.	.....	.....	32,418	242,947
Sept.	.....	.....	23,847	301,330
Oct.	.....	.....	20,202	220,209
Nov.	.....	.....	35,272	299,263
Dec.	.....	.....	19,708	282,655
Total	.....	.....	316,761	2,832,764

ORIGIN OF MARCH IMPORTS

Gross Tons

	Pig iron	Manganese ore	Ferromanganese
Belgium	50	.....	.....
France	50	.....	25
Norway	165	.....	1,111
Sweden	40	.....	.....
United Kingdom	50	.....	358
Canada	584	171	1,205
British India	1,769	13	.....
Germany	.....	3	.....
Soviet Russia in Europe	.....	10,256	.....
Chile	.....	188	.....
Gold Coast	.....	2,248	.....
Italy	.....	.....	21
Netherlands	.....	.....	80
Total	2,708	12,879	2,800

	Sheets, skelp and sawplates	Structural steel	Steel bars	Hoops and bands
United Kingdom	12	4	62	.....
Belgium	380	1,515	662	881
Germany	18	29	216	312
Sweden	12	.....	380	16
France	.....	170	108	141
Canada	.....	1	5	.....
Austria	.....	.....	6	.....
Czechoslovakia	.....	.....	3	.....
Total	422	1,719	1,442	1,349

UNITED STATES EXPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

Commodity	March, 1935	Feb., 1935	Jan. thru March, 1935
Pig iron	137	284	682
Ferromanganese and spiegeleisen	29	.....	32
Iron and steel scrap	228,338	151,720	559,688
Tin plate scrap (1)	2,845	2,894	9,948
Waste-waste tin pl. (1)	1,784	1,718	5,775
Ingots, blooms, billets, slabs, sheet bars	7,993	5,330	16,544
Bars, iron	80	34	347
Bars, steel	4,110	5,126	13,981
Bars, alloy steel	226	281	661
Wire rods	1,354	1,681	6,314
Boiler plate	70	143	261
Other plate, not fab	3,487	3,797	9,217
Skelp, iron or steel	990	1,171	2,534
Iron sheets, galvanized	263	56	418
Steel sheets, galvanized	7,092	6,178	18,594
Steel sheets, black	6,706	6,953	25,825
Iron sheets, black	316	468	1,185
Strip steel, cold-rolled	2,225	1,293	4,815
Strip steel, hot-rolled	2,464	2,219	6,158
Tin plate, taggers tin	9,117	10,266	34,337
Terne plate (1)	209	266	757
Water, oil, gas and other tank, except lined	604	501	1,879
Shapes, not fabricated	3,100	2,210	6,973
Shapes, fabricated	1,307	1,489	3,948
Plates, fabricated	97	71	210
Metal lath	97	44	156
Frames, sashes and sheet piling	340	637	1,536
Rails, 50 pounds	6,173	1,181	8,251
Rails, under 50 pounds	548	8	659
Rails fastenings	454	281	1,038
Switches, frogs, crsgs	74	142	354
Railroad spikes	225	231	688
Railroad bolts, nuts	55	40	137
Boiler tubes, seamless	680	307	1,779
Boiler tubes, welded	110	13	163
Casing and oil-line pipe, seamless	2,098	3,392	7,950
Casing and oil-line pipe, welded	792	1,074	3,253
Seamless black pipe, other than casing, etc.	257	571	1,039
Malleable iron screwed pipe fittings	304	184	757
Cast iron screwed pipe fittings	120	116	414
Cast iron pressure pipe, fittings	525	1,865	2,750
Cast iron soil pipe, fittings	546	394	1,220
Welded black steel pipe	2,268	1,320	5,376
Welded black wrought iron pipe	398	265	782
Welded galv. steel pipe	2,365	1,815	6,587
Welded galv. wrought iron pipe	151	63	239
Riveted iron, steel pipe and fittings	8	60	124
Plain iron, steel wire	1,138	1,039	3,996
Galvanized wire	2,332	853	4,586
Barbed wire	2,459	2,249	7,270
Woven wire fencing	163	64	389
Woven wire screen cloth	97	74	271
Wire rope	525	319	1,075
Other wire and mfrs	590	306	1,261
Wire nails	1,270	548	2,601
Horseshoe nails	65	47	186
Tacks	44	27	107
Other nails, staples	226	231	696
Bolts, machine screws	665	574	1,677
Iron castings	672	564	2,085
Steel castings	368	231	715
Car wheels and axles	8,290	695	9,474
Horseshoes	2	21	24
Iron and steel forgings, n. e. s.	594	543	1,564
Total gross tons	323,035	228,537	814,312

(1) New classifications. No comparable figures for 1934 or previous years.

Died:

WILLIAM J. OLCOTT, 73, for 19 years president of the Oliver Iron Mining Co., Duluth, and retired in 1928, in Pasadena, Calif., April 29. Associated with the Chapin mine, Iron Mountain, Mich., in 1885, the following year he went to the Germania and Ashland mines as chemist and engineer, remaining there until 1890. On formation of the United States Steel Corp. in 1901, he became general manager of all the corporation's iron mines in the Lake Superior district, the operating company being the Oliver Iron Mining Co. He was made vice president in 1905 and president four years later.

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William H. French, 63, public relations director of Carnegie Steel Co., Pittsburgh, in that city, April 29, after a year's illness. Born in New Haven, Conn., he was educated in New York city schools and attended Yale university. He worked on newspapers in New England, and in 1902 he became correspondent for the Associated Press in Boston. Later, he was attached to the New York office of the Associated Press as assistant to the president, and subsequently served this same company as political writer in Washington. In 1906 he became Pittsburgh correspondent, and then associated himself with Carnegie Steel Co. in 1919 as assistant to the vice president.

♦ ♦ ♦

Frank D. Grunder, 67, manager of sales of tube products for Jones & Laughlin Steel Corp., Pittsburgh, April 30. Born in Minerva, O., his first business affiliation was with the American Tube & Iron Co., Cleveland. In 1895 he became identified with National Tube Co., Pittsburgh, but left in 1916 to join Jones & Laughlin as manager of sales for the pipe department, the position which he retained until his death. He was a member of the American Petroleum institute, the American Gas association and a number of Pittsburgh clubs.

♦ ♦ ♦

Anson S. Burwell, 85, president of Seattle Hardware Co., Seattle, April 22.

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Guy E. Tarbert, purchasing agent for the Anchor Post Fence Co., Baltimore, in that city, April 23. He became associated with the company in 1928.

♦ ♦ ♦

Charles A. Stockstrom, 83, chairman of the board of the American Stove Co., St. Louis, and president of the company for 25 years, in Mount Clemens, Mich., April 25.

♦ ♦ ♦

Oscar M. Leich, 59, president of the Leich Electric Co., Genoa, Ill., manufacturer of telephone equipment, in Genoa, April 29. He was chief engineer of the Stromberg-Carlson Co. in 1907 when he left to form the company which bears his name.

♦ ♦ ♦

Charles A. Paeschke, 77, president of the Geuder, Paeschke & Frey Co., Milwaukee, in that city, April 28. With William Geuder he founded the company in 1880 and was active head of it at the time of his death.

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Charles J. Clinger, 59, superintendent of the blooming mill of Corrigan, McKinney Steel Co., Cleveland, in Lakewood, O., May 1. Born in Youngstown, O., he was formerly a heater with Youngstown Sheet & Tube Co., removing to Cleveland about 20 years ago when the Corrigan, McKinney plant was being built.

♦ ♦ ♦

Patrick J. Moohan, 56, prominent industrialist and civic leader at Kenosha, Wis., and works manager of the Nash Motors Co. since its inception, in Kenosha, April 27. He was works manager of the Buick Motor Co., Flint, Mich., until 1916 when the Kenosha industry was founded. As an expert machinist and toolmaker, Mr. Moohan as a young man worked with Henry Ford in a Detroit shop in the development of one of his earliest models.

Production

STEEL production dipped 2 points last week to 44 per cent, due chiefly to slackening in automotive demands, growing out of labor trouble. Youngstown contributed mainly to this reduction, declining 6 points to 50 per cent, while losses also were noted in Chicago and eastern Pennsylvania. Details follow:

Youngstown—Off sharply to 50 per cent, a loss of 6 points. Preliminary schedules for this week indicate a 50 per cent rate, and mill managers are optimistic concerning

Steelmaking Operations

Percentage of Open Hearth Ingot Capacity Engaged in 10 Leading Districts

	Week ended May 4	Change	Same week 1934	Same week 1933
Pittsburgh	37	None	48	22
Chicago	51	— 1	62½	29½
Eastern Pa.....	28½	— ½	44½	15½
Youngstown...	50	— 6	61	33
Wheeling	79	+ 3	79	61
Cleveland	54	— 3	80	49½
Buffalo	57	— 7	66	38
Birmingham..	54½	None	52	14
New England	30	+ 5	89	†
Detroit	82	None	94	38
Average.....	44	— 2	60	33

†Not reported in 1933.

Convention Calendar

May 14—Machinery and Allied Products institute. Annual meeting at Hotel Cleveland, Cleveland. Alexander Konkle, 221 North LaSalle street, Chicago, is assistant secretary.

May 14-15—American Gear Manufacturers association. Annual meeting at Penn-Lincoln hotel, Wilkinsburg, Pa. J. C. McQuiston, Penn-Lincoln hotel, Wilkinsburg, Pa., is manager-secretary.

May 14-16—American Steel Warehouse association. Twenty-sixth annual convention at Edgewater Beach hotel, Chicago. Walter S. Doxsey, 442 Terminal Tower, Cleveland, is secretary.

May 15-16—National Metal Trades association. Convention and exhibit in Cleveland. Harvey S. Flynn, 122 South Michigan avenue, Chicago, is secretary.

May 19-23—National Electrical Manufacturers' association. Spring meeting at Homestead hotel, Hot Springs, Va. R. J. Blais, 155 East Forty-fourth street, New York, is secretary.

May 20-23—National Associaton of Purchasing Agents. Annual convention and exhibit at Waldorf-Astoria hotel, New York. George A. Renard, 11 Park Place, New York, is secretary.

May 22—Porcelain Enamel institute. Annual meeting at Statler hotel, Cleveland. Kurt R. Groener, 612 North Michigan avenue, Chicago, is executive secretary.

May 23—American Iron and Steel institute. Spring meeting at Hotel Commodore, New York. Walter S. Tower, 350 Fifth avenue, New York, is executive secretary.

May 24—American Society for Metals. Special sectional meeting of New York, Philadelphia, New Jersey and Lehigh Valley chapters at Hotel Pennsylvania, New York. T. N. Holden, 1219 Glenwood road, Brooklyn, N. Y., is secretary at New York.

June 6-7—Gray Iron Founders' society. Meeting at Hotel Gibson, Cincinnati. Henry M. Halsted Jr., Public Square building, Cleveland, is executive vice president.

June 10-13—American Electro-Platers' society. Annual meeting at Stratfield hotel, Bridgeport, Conn. E. Steen Thompson, 905 West Tenth street, Erie, Pa., is secretary.

June 24-28—American Society for Testing Materials. Thirty-eighth annual meeting at Book-Cadillac hotel, Detroit. C. L. Warwick, 260 Broad street, Philadelphia, is secretary.

Aug. 19-23—American Foundrymen's association. Thirty-ninth annual convention at Royal York hotel, Toronto, Ont. C. E. Hoyt, 222 West Adams street, Chicago, is secretary.

operations over the next four weeks.

Buffalo—Down 7 points to 27 per cent, lowest point in three months. Eleven of 38 open hearths are on.

Central eastern seaboard — Off fractionally to 28 to 29 per cent, with indications pointing to a further slight reduction this week, despite the fact that one eastern mill, which has been drawing on ingot stocks, may put in one open hearth, raising its total to two. Demand for tin plate production is not what it was recently, and there is a tapering in steel requirements for wire and certain other products.

Cleveland-Lorain—Down 3 points to 54 per cent, Corrigan, McKinney Steel Co. taking off one open hearth to operate 8; Otis Steel Co. continuing with six, and National Tube Co., Lorain, seven. Sheet and strip mill operations here have dropped to 50 per cent; steel bar mills to 50 per cent, due to labor difficulties at consumer plants.

New England—Up 5 points to 30 per cent last week, with indications of an additional slight increase this week.

Chicago — Declined 1 point to 51 per cent, with a further small recession regarded as not unlikely later this month. Blast furnace schedules are steady, 14 of the districts' 36 steelworks stacks and two merchant units being active.

Wheeling — Up 3 points to 79 per cent, as a leading steel producer stepped up its open-hearth operations last week by the addition of another furnace. Out of 37 open hearths, 29 are in operation.

Pittsburgh — Unchanged at 37 per cent, with indications of a 2 or 3-point decline this week, due to certain automotive holdups on steel. Tin plate, sheets and strip are leading finishing mill operations. National Tube Co. has resumed with its bessemer department at McKeesport, Pa., after four weeks of idleness.

Twenty-one out of 60 steelworks blast furnaces are in operation, a gain of one over a week ago. National Tube blew in two furnaces at Monongahela, April 28. Jones & Laughlin blew in a fourth Aliquippa furnace, while Bethlehem banked a Cambria stack.

Reins of Keystone Steel & Wire Co. Change Hands

W. H. Sommer

W. H. SOMMER has been elected president of the Keystone Steel & Wire Co., Peoria, Ill., succeeding W. C. Buchanan, formerly president and general manager.

R. E. Sommer has been named vice president and general manager, succeeding W. W. Barton as vice president.

D. P. Sommer is the new vice president and general superintendent, succeeding E. P. Kastien in the latter post. Mr. Kastien also was purchasing agent.

C. W. LaPorte has been elected a vice president.

H. G. Sommer continues as executive vice president and treasurer.

W. O. Fritze has been elected assistant treasurer.

Hiram E. Todd and A. G. Heidrich, members of the executive committee, and John V. W. Reynders, consulting engineer, are no longer with the Keystone organization.

R. E. Sommer

D. P. Sommer

H. G. Sommer

C. W. LaPorte

Industrial Men in the Day's News

Sydney G. McAllister, New President, International Harvester Co.

Moffett Studio

Starting as office boy 38 years ago, he has made a rapid rise through various divisions.

In 1914 he was sent to Europe and later became manager of the Harvester works there, returning in 1931.

Taking charge of manufacturing and engineering departments in 1932, he now heads the entire company.

SYDNEY G. McALLISTER, recently elected president of the International Harvester Co., Chicago, as noted in STEEL for April 29, p. 75, has risen through the ranks of that company during his 38 years' affiliation.

His first connection was in 1897 when, at the age of 18, he became an office boy at the McCormick works, Chicago. Following his promotion to timekeeper and later to assistant production manager, he was transferred in 1903 to the Hamilton works as assistant superintendent.

Going to the Auburn, N. Y., works in 1908 as assistant superintendent, he was made superintendent there in 1911.

His foreign service began in 1914 when he was sent to Europe and made assistant works manager. In 1917 he was appointed European works manager.

Recalled to the United States in 1931, he was elected vice president in charge of the engineering, traffic, fiber, and patent departments, and in 1932 he was placed in charge of the manufacturing and engineering departments. Since May 4, 1934, he has been first vice president.

As president Mr. McAllister succeeds Addis E. McKinstry, who has retired because of poor health after 49 years of service. He continues as a director of the company. Mr. McKinstry was elected a vice president in 1919 and president in 1921.

♦ ♦ ♦

Homer C. Butts has been appointed assistant to the president of Sharon Steel Hoop Co., Sharon, Pa. Formerly vice president of Newton Steel Co., Monroe, Mich., he served that company previously in various capacities since 1924, first as metallurgist, then as assistant vice president in charge of operations, and since 1931, vice president in charge of operations. Prior to his association with Newton Steel he was affiliated with General Motors Research Corp., Dayton, O.

♦ ♦ ♦

R. B. Sanders, formerly with the New York office of Weirton Steel Co., Weirton, W. Va., has been made Boston district manager, succeeding W. T. Snellgrove, who has been transferred to the New York office. This change was made necessary because of the ill health of Mr. Snellgrove.

E. T. Weir Jr. has been transferred from Philadelphia to the New York sales office.

♦ ♦ ♦

Charles E. Miller and Lloyd H. Diehl have been elected directors of L. A. Young Spring & Wire Co., Detroit, succeeding Henry Ruen and A. D. Coffin. Mr. Miller is president and general manager of the Michigan Steel Tube Products Co., Detroit. Mr. Diehl is president and general manager of the Detroit Gasket Mfg. Co., and director of Crown Cork & Seal Co.

C. M. Young has been elected treasurer of the Young company, succeeding L. A. Young who has been reelected vice president.

♦ ♦ ♦

A. L. Lott, vice president of Motor Products Corp., Detroit, has been elected president to succeed W. C. Rands, resigned.

♦ ♦ ♦

William D. Reid, secretary and treasurer of Follansbee Bros Co. Inc., Pittsburgh, has resigned.

Scott Follansbee, sales manager at Cleveland for Follansbee Bros., has resigned, effective May 1. He is a son of W. U. Follansbee who for years headed the company.

H. L. Dublin, formerly representing the Follansbee company in northern New York with headquarters at Rochester, N. Y., succeeds Mr. Follansbee in Cleveland.

♦ ♦ ♦

Dr. John Chipman has been appointed associate director of the research laboratories of the American Rolling Mill Co., Middletown, O. He will be responsible for research activities in the field of melting and refining metals. For six years he was research engineer in the department of engineering research at the University of Michigan, Ann Arbor, Mich., and was the recipient of the Howe medal of the American Society for Metals in 1934, awarded for his paper, "Application of Thermodynamics to the Deoxidation of Liquid Steel."

Dr. John Chipman

♦ ♦ ♦

Carl C. Wood has been named general superintendent of the Chevrolet Motor Co. foundry at Saginaw, Mich., succeeding the late John R. Dunham.

Starting with the plant in 1920, for the past year Mr. Wood has been day production superintendent.

♦ ♦ ♦

P. M. Ford, for the past 25 years active in steel sales in the Cleveland district, has become associated with the sales department of Steel Improvement & Forge Co., Cleveland.

♦ ♦ ♦

N. W. Pickering, president of Farrel-Birmingham Co. Inc., Ansonia, Conn., has sailed for Europe where he will spend two months in visiting the company's representatives.

♦ ♦ ♦

J. J. McDermott, formerly secretary and treasurer, has been elected vice president and general manager of the Wrought Iron Co., Lebanon, Pa.

Vincent F. Ache, former comptroller, has been elected treasurer; and Charles A. Donley, secretary. The latter will continue as superintendent of the bolt department.

♦ ♦ ♦

A. J. O'Leary has been appointed assistant to general manager of sales at Lukens Steel Co., Coatesville, Pa. Prior to joining the Lukens organization in 1916, he was with the Pennsylvania railroad and Alan Wood Steel Co. He spent five years in the mills and mill servire departments at Lukens before he was transferred to the sales department, where he served since 1931 until his recent appointment.

A. J. O'Leary

♦ ♦ ♦

C. A. Bishop, treasurer of the Anchor Post Fence Co., Baltimore, has taken over duties of purchasing agent, succeeding the late Guy E. Tarbert. Prior to his transfer to Baltimore, Mr. Bishop was in charge of purchases at the company's Cleveland plant.

♦ ♦ ♦

George R. Beasom, manager, Scully Steel Products Co. at Boston, has been elected president of the New England chapter of the American Steel Warehouse association. Other officers include: First vice president, Herber C. Wills, Boston manager, Joseph T. Ryerson & Son Inc.; second vice president, Carroll S. Harvey, Arthur C. Harvey Co., Allston, Mass.; and secretary-treasurer, Quincy W. Wales, Brown-Wales Co., Boston.

♦ ♦ ♦

James T. Pardee, vice president and secretary of the Dow Chemical Co., Midland, Mich., recently was

Jones & Laughlin Sales Executives in New Posts

James C. Foster

A. W. Herron Jr.

M. M. Harper

JAMES CAVEN FOSTER has been appointed general manager of sales for Jones & Laughlin Steel Corp., Pittsburgh, as noted in STEEL last week. Previously he had been manager of sales in the company's wire department. He has been identified with Jones & Laughlin for the past 22 years, with the exception of a brief period during the World war. He was born in Pittsburgh in 1894, and following public and high school training became associated with Jones & Laughlin in January, 1913. He was employed in the order department and in 1915 was transferred to the sales department in the general headquarters in Pittsburgh. Upon his discharge from war service he returned to Jones & Laughlin and became assistant to the manager of sales of wire products. In January, 1932, he succeeded E. D. Batchelor as manager of sales of wire products, and has since been identified with the company in that capacity.

A. W. Herron Jr., who has been district sales manager for Jones & Laughlin at Cincinnati since 1925, has been appointed manager of wire sales. He has been identified with the corporation since 1910.

M. M. Harper, affiliated with the company's Cincinnati office since 1922 and recently assistant district manager of sales, will become district sales manager for the Cincinnati district. He has been with Jones & Laughlin since 1907.

elected to the additional office of chairman of the board, succeeding the late A. E. Convers. For a time engineer of bridges for the city of Cleveland, Mr. Pardee was a classmate of the late Dr. Herbert H. Dow, the two being founders of Dow Chemical.

♦ ♦ ♦

S. B. Bechtel, president of the S. F. Bowser & Co., Fort Wayne, Ind., has been re-elected. Other officers include: Vice president, H. J. Grosvenor; secretary-treasurer, E. D. Eggimen; and general counsel, W. J. Vesey.

♦ ♦ ♦

J. K. B. Hare, central station and transportation sales manager of the central sales district for the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has been appointed manager of the Buffalo office of the company, succeeding H. F. Boe, who has been named assistant manager of the eastern district, in New York. Mr. Hare joined the Westinghouse organization in 1916 and has held numerous engineering and sales positions.

♦ ♦ ♦

H. H. Wood, until recently manager of the rolling mill division of the Timken Roller Bearing Co., Canton, O., has joined the engineering staff of Morgan Construction Co., Worcester, Mass., and will take charge of a new office of the company to be opened May 15 in the Koppers building, Pittsburgh. He was chief engineer for the Laclede Steel Co., St. Louis, in 1925, just prior to the development and installation of a 4-high hot strip mill in this plant, one of the first antifriction bearing equipped mills of this type. In 1929 he became associated with the Timken sales department and last year was appointed manager of the rolling mill division.

H. H. Wood

♦ ♦ ♦

C. O. Nordensson, for many years general manager of the Lee B. Mettler Burner Co., has been appointed head of the industrial gas burner activities of the Roberts-Gordon Appliance Corp., Buffalo. He has had wide experience in the application of gas to industrial uses, at one time being associated with Westinghouse Electric & Mfg. Co., and later with Fairbanks, Morse & Co. He is also a former general manager of the Gas Combustion Co., Pittsburgh, blast furnace gas burners. He is the inventor of the Duquesne burner, the first multi-unit low-pressure burner manufactured and sold by the Duquesne Burner Service Co., of which he was also general manager.

♦ ♦ ♦

Clarence B. Randall, vice president of Inland Steel Co., Chicago, has been appointed vice chairman of Chicago's 1935 community fund drive, a position he held also in 1934.

♦ ♦ ♦

David Benjamin has resigned as vice president and director of the Gabriel Co., Cleveland, and after June 30 will devote full time as secretary-treasurer of Pressure Castings Inc., Cleveland, manufacturer of die castings.

♦ ♦ ♦

Norman F. Smith has been appointed secretary and treasurer of the Osborn Mfg. Co., Cleveland. Associated with the company since 1925, he has recently been vice president and manager of Rubico Brush Manufacturers Inc., New York, Osborn subsidiary.

♦ ♦ ♦

W. W. Hoagland, president of Hayes Body Corp., Detroit, has been elected chairman of the board.

A. A. Anderson, secretary and treasurer, has been named president and treasurer.

E. J. Connolly, vice president, has been appointed vice president and general manager.

♦ ♦ ♦

Edward R. Weidlein, director of the Mellon Institute of Industrial Research, Pittsburgh, will be awarded the Chemical Industry medal for 1935 by the American section of the Society of Chemical Industry, for "valuable application of chemical research to industry." Presentation will be made this fall.

♦ ♦ ♦

Dan Lewis has been appointed manager of the roll department of the Continental Roll & Steel Foundry Co., East Chicago, Ind., with headquarters in the Grant building, Pittsburgh.

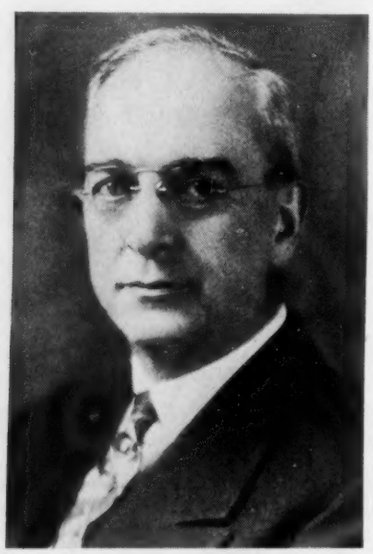
W. E. Cadman has been named assistant manager, located at the Hubbard Steel Foundry division, East Chicago.

♦ ♦ ♦

Myron H. Blanchard, for a number of years active in the steel industry in metallurgical and sales work, and later associated with an eastern publisher, has been appointed to take charge of the publicity and advertising activities of the Quigley Co. Inc., New York, manufacturer of refractory specialties.

A. L. Diederich has been appointed assistant to the manager of the fire brick and insulating brick department.

J. P. Kessler Jr.



M. N. Smith

CUTLINES on these two photographs were inadvertently transposed on page 18 of STEEL for April 29. J. P. Kessler Jr., in direct charge of the scheduling of all rolled products of the Carnegie Steel Co., Pittsburgh, since 1900, has retired. M. N. Smith, with Walter J. Weldin, has taken over Mr. Kessler's responsibilities. Mr. Smith has been identified with Carnegie since 1895, having spent all his time in production and scheduling activities

EDITORIAL

How To Chill Industry's Attitude Toward NIRA

AS THIS is being written, it is impossible to forecast what congress will do in extending the term of NIRA. Wednesday the senate finance committee voted to extend the act until April 1, 1936, with a ban against price fixing, a limiting of codes to interstate commerce and a provision to enable the President to review existing codes in order to adjust them to the foregoing changes.

Apparently this action on the part of the senate committee disregards the administration's recommendation that NIRA be extended for a two-year period. The maneuvers of the past week also show that there are many other conflicts in opinion, not only between the senate and the administration, but also between various blocs of senators and representatives.

Confusion over NIRA is not confined to congress or even to Washington. Industrial executives are far from agreement as to the wisdom of extending the act. Public opinion on this point is hopelessly divided. A. F. of L. spokesmen are positive in their demands that NIRA be continued, but a poll of all employes would show a sharp clash of conflicting views.

The reason for this widespread uncertainty is that NIRA has failed to make a clean-cut record of success. From a short range viewpoint, it can claim certain accomplishments, but even on this basis it is responsible for many maladjustments which, in the minds of numerous critics, more than offset its good points. From the long range standpoint, the merits of NIRA are even more doubtful. There is a growing conviction in many quarters that when we get out of the present mess and can review the depression period dispassionately, we will find that NIRA not only did more harm than good, but that it actually retarded recovery.

Since Merit of NIRA Is in Doubt, Congress Should Try To Profit from Old Mistakes

In view of this well-founded uncertainty in regard to the recovery act, it would be expected that the government administration and the proponements of NIRA in congress would be particularly anxious to see that the good points of the old act would be retained and that the doubtful ones would be discarded. One would think that the administration would try to profit from its mistakes of 1933.

But what do we find?

We discover in the tentative draft of the new bill practically all of the jokers that were slipped surreptitiously into the original act under the excitement of a dramatic emergency. In addition we find many new schemes calculated to hog-tie American industry and to enhance the power of selfish minority political blocs. We find all sorts of "permissive" clauses which give to the federal government and particularly to its Chief Executive authority far beyond anything that is justified under present circumstances. We discover further restrictions against the employer in his contacts with employes, but we search in vain for anything which holds the professional labor union organizer or agitator responsible for his acts.

New Deal Still Thinks of NIRA in Terms Of Regimentation and Discrimination

If the discussion to date can be taken as indicative, the administration's idea of an improved NIRA is an act which gives the President the authority of life or death over American industry; which completely divorces the employer from any contact with his employes and yet opens the door wide to coercion, racketeering, and pressure of all kinds by professional labor unions; which outlaws the employe representation plan and gives *carte blanche* to A. F. of L. to do its worst; and which takes administration of codes away from persons who know something about the problems of industry and puts it in the hands of the academicians of the federal bureaucracy.

Also, the discussions to date indicate that the proponents of NIRA look upon the act as a reform or policing measure. No one in the administration or in congress seems to remember that NIRA was supposed to promote recovery.

If the Roosevelt administration and the congress really want to kill NIRA, there is no easier way than to continue to browbeat industry. If they want to alienate the support of those industrial executives who up to the present point have favored the extension of their codes, there is no surer way than to continue to approach the legislative task in a spirit of discrimination and vindictiveness against employers.

The burden of proof rests with the administration and congress. Industry will not be interested in "co-operation" that works only one way—adversely.

STEEL INDUSTRY NETS $13,140,000 in 1934 BEFORE DIVIDENDS, BOND INTEREST

TWENTY-THREE leading steel producers, representing ingot capacity of 62,846,488 gross tons or 91.2 per cent of the country's total, in 1934 earned $12,734,147 after charges but prior to dividends and interest on bonds. Assuming the experience of these 23 producers to be typical, the net for the entire industry last year was approximately $13,140,000.

This showing of the steel industry, disclosed by the ninth annual financial survey by STEEL, represents a profit of 0.33 per cent on the capital invested in the industry. By comparison the loss in 1933 was 0.90 per cent, while in 1932 it was 2.85 per cent. Details of the survey will be found in the acccompanying insert opposite this page.

It should be emphasized that this reversion to black, after a sojourn of two years in the red, is predicated upon the industry's showing before dividends and interest on bonds. After paying bond interest, the net loss of the 23 reporting producers was $16,936,481, which is a sharp reduction from the $64,710,702 in 1933.

Preferred Dividend Arrearages Are Deducted

In its compilation STEEL has consistently followed the policy of computing losses or profits by taking into account the preferred dividend situation. Where there are arrearages, these have been considered ahead of the common stock and deducted from the showing, thus making all comparisons equitable.

Barring several minor exceptions, the trend financially in 1934 was toward improvement over 1933. Eighteen of the 23 producers figuring in this compilation made a profit before dividends and bond interest, compared with only 12 in 1933. Since 15 of the 23 also reported earnings prior to dividends, it is evident that bond interest was sufficient to throw the other eight from black to red.

Of the 23 reporting corporations, 21 made a better showing in 1934 than in 1933. They reduced their losses, or turned a loss into a profit, or increased their profit. The two exceptions were Gulf States and Granite City; the former went from black to red in 1934 while the net of Granite City was lowered somewhat. On the whole, the experience of the medium-size and small companies was relatively better than that of the larger, fully-integrated interests.

In point of capitalization, steel last year remained a four billion dollar industry. Its total assets—$4,213,949,890—were down about $43,000,000 during the year. Current assets, on the other hand, showed a mild rise of about $36,000,000, reaching $887,830,004 at the close of the year. Current liabilities, which were $145,088,752 on Dec. 31, were up about $7,500,000.

Owing to a working down of funded debt, mainly through the operation of sinking funds rather than through refinancing or complete retirement of bond issues, total bonded debt of the steel industry recorded only a slight change in 1934, when a $9,000,000 reduction left 23 producers with fixed obligations of $560,000,000.

Regarding surplus change, there was an even division among producers who reported an improvement as against those who showed a loss in the sum of their capital and earned surplus accounts in 1934 over 1933. Twelve producers recorded a gain in surplus, whereas the remainder, or 11, continued to drain against this account, the latter chiefly against earned surplus figures. However, the gains of 12 did not include the leading five steelmakers, and therefore, failed to balance heavy surplus losses by United States Steel Corp., Bethlehem Steel Corp., Republic Steel Corp., Jones & Laughlin Steel Corp., and Youngstown Sheet & Tube Co.

Loss Is 27 Cents Per Ton of Capacity

Owing to changed interpretations which many of the smaller steel producers placed on their rated ingot capacity, at the end of the year the total for the 23 companies under consideration increased from 62,531,368 tons in 1933 to 62,846,488 tons at the close of 1934. Relating the ingot capacity figure in gross tons to the net loss before dividends, it is shown that for each ton of ingot capacity the industry lost 27 cents.

In the year closed, receivership proceedings came to Follansbee Bros. Co. Inc., and financial reorganization to the Colorado Fuel & Iron Co. These two companies, with Wickwire-Spencer Steel Co. in receivership as of a prior date, were omitted from the accompanying chart owing to the incomplete nature of data available for survey purposes. Otis Steel Co., however, whose bonds were in default through 1933, has been lifted from the hands of a bondholders' committee and was placed on a comparable basis with the remaining 22 steelmakers financially.

Other producers who are not represented in this survey are omitted because they did not wish to submit data.

STEEL wishes to acknowledge the kind cooperation of the treasurers and comptrollers of the companies reviewed for supplying earnings statements for the years covered.

Financial Analysis of Iron and St

Earnings, Capitalization, Assets and Liabilities of 23 Producers Having an Agg

(x) Indicates Earnings

NAME OF COMPANY	Year	No. Shares Common Stock Outstanding	Par Value	Common Stock	Preferred Stock	Funded Debt	Surplus	Total Capitalization	Net Loss Before Dividends	Total Loss Before Div. an Int. on Bonds
United States Steel Corp.....	1934	8,703,252	$100	$870,325,200	$360,281,100	$95,663,689	$538,575,628	$1,946,095,638	$21,667,780	$16,616,728
	1933	8,703,252	100	870,325,200	360,281,100	93,179,823	557,330,506	1,962,366,650	36,501,122	31,336,670
Bethlehem Steel Corp.....	1934	3,194,858	No	315,396,093	93,388,700	126,429,003	76,370,540	611,584,336	550,571(x)	7,354,393(x)
	1933	3,200,000	No	315,900,000	93,388,700	131,526,264	81,145,825	621,960,789	8,735,723	2,003,672
Republic Steel Corp.....	1934	2,047,803	No	92,058,968	59,560,800	49,106,700	35,951,522	236,677,990	3,459,428	169,531
	1933	1,992,064	No	91,289,344	59,560,800	53,257,950	39,326,317	243,434,410	4,049,253	1,133,294
Jones & Laughlin Steel Corp...	1934	576,320	100	57,632,000	58,713,900	7,224,941	45,855,923	169,426,764	3,670,672	3,327,357
	1933	576,320	100	57,632,000	58,713,900	7,669,000	49,881,293	173,896,193	5,366,996	4,971,096
Youngstown Sheet & Tube Co.	1934	1,200,000	No	75,256,097	15,000,000	86,148,000	14,924,250	191,328,247	2,298,785	1,704,263(x)
	1933	1,200,000	No	75,256,097	15,000,000	88,500,000	17,585,780	196,341,877	7,815,529	3,881,105
National Steel Corp.....	1934	2,155,777	25	53,894,425	None	39,299,333	52,714,398	145,908,156	6,050,722(x)	8,020,793(x)
	1933	2,156,832	25	53,920,800	None	39,561,667	48,815,578	142,298,045	2,812,407(x)	4,555,631(x)
American Rolling Mill Co.....	1934	1,710,776	25	42,769,409	1,964,900	39,660,569	14,634,741	99,029,619	966,566(x)	3,238,472(x)
	1933	1,710,776	25	42,769,409	1,964,900	36,784,050	14,439,517	95,957,876	673,089	1,471,604(x)
Inland Steel Co.....	1934	1,200,000	No	35,000,000	None	39,600,000	20,506,870	95,106,870	3,729,890(x)	5,673,271(x)
	1933	1,200,000	No	35,000,000	None	40,500,000	18,398,163	93,898,163	166,693(x)	2,141,468(x)
Wheeling Steel Corp.....	1934	402,301	No	20,115,050	38,286,100	25,250,000	16,688,187	99,604,827	529,202(x)	1,914,393(x)
	1933	387,635	No	19,381,750	38,079,700	26,218,000	14,945,719	98,625,169	284,430	1,164,139(x)
Crucible Steel Co. of America..	1934	450,000	100	45,000,000	25,000,000	12,750,000	23,277,565	106,027,565	75,157(x)	760,850(x)
	1933	450,000	100	45,000,000	25,000,000	13,000,000	22,781,344	105,781,344	354,750	413,349(x)
Otis Steel Co.....	1934	841,002	5	4,205,010	11,503,895	10,827,500	1,986,199	28,522,604	560,891(x)	1,277,711(x)
	1933	841,002	5	4,205,010	11,503,433	10,827,500	1,425,770	27,961,712	1,509,528	790,931
Lukens Steel Co.§.....	1934	317,976	10	3,179,760	None	3,633,400	3,642,816	10,805,888	42,598(x)	234,021(x)
	1933	317,976	10	3,179,760	None	3,633,400	3,600,218	10,705,478	462,202	264,786
Pittsburgh Steel Co.‡.....	1934	253,500	100	25,350,000	10,475,000	7,927,000	3,618,785	47,370,785	1,330,390	736,365
	1933	253,500	100	25,350,000	10,475,000	8,394,000	4,961,601	49,180,601	2,339,402	1,720,004
Allegheny Steel Co.....	1934	610,732	No	3,817,075	3,342,600	None	9,812,549	16,972,224	835,928(x)	835,928(x)
	1933	610,732	No	3,817,075	3,342,600	None	11,351,122	18,510,797	292,017(x)	292,017(x)
Gulf States Steel Co.....	1934	197,500	No	16,850,000	2,000,000	4,812,500	3,052,476	26,714,976	27,558	237,944(x)
	1933	197,500	No	16,850,000	2,000,000	5,000,000	3,080,034	26,930,034	264,611(x)	500,592(x)
Sharon Steel Hoop Co.....	1934	375,000	No	1,875,000	None	5,328,000	12,086,199	19,289,199	10,667	301,211(x)
	1933	375,000	No	1,875,000	None	5,416,428	12,197,555	19,960,982	274,781	37,745(x)
Granite City Steel Co.....	1934	254,992	No	6,088,821	None	None	3,286,279	9,375,100	258,761(x)	258,761(x)
	1933	254,992	No	6,088,821	None	None	2,918,134	9,006,955	506,652(x)	506,652(x)
Continental Steel Corp.‡.....	1934	175,648	No	6,146,183	2,773,500	1,229,500	1,614,250	11,763,433	480,153(x)	569,062(x)
	1933	175,648	No	6,081,838	2,862,000	1,280,500	1,112,080	11,336,418	59,871	15,273(x)
Midvale Co.....	1934	200,000	No	10,574,621	None	None	1,086,958	11,661,579	632,591(x)	632,591(x)
	1933	200,000	No	14,574,621	None	None	737,604	15,312,225	28,349(x)	28,349(x)
Laclede Steel Co.....	1934	206,250	20	4,125,000	None	650,000	1,516,370	5,641,370	104,012(x)	139,762(x)
	1933	206,250	20	4,125,000	None	650,000	1,536,107	5,661,107	40,483	4,837
Scullin Steel Co.....	1934	30,000	No	150,000	500,000	4,559,500	1,118,524	6,328,024	23,871	304,926
	1933	30,000	No	150,000	500,000	4,559,500	1,393,020	6,602,520	327,481	609,325
Vanadium-Alloys Steel Co.‡...	1934	210,000	No	2,000,000	None	None	4,279,041	6,279,041	293,280(x)	293,280(x)
	1933	210,000	No	2,000,000	None	None	4,097,569	6,097,569	147,494	147,494
Ludlum Steel Co.....	1934	207,750	1	207,750	4,570,000	None	2,096,663	6,874,413	442,348(x)	442,348(x)
	1933	205,250	1	205,250	4,620,000	None	2,006,167	6,831,417	161,063(x)	161,063(x)
Totals.....	1934	25,521,437		$1,692,016,462	$687,360,495	$560,099,635	$888,696,733	$3,908,388,648	$16,936,481	$12,734,147(x)
	1933	25,454,729		1,694,976,975	687,292,133	569,958,082	915,067,023	3,948,658,331	64,710,702	35,575,332

(x) Earnings.
‡ Fiscal year ends June 30.
§ Fiscal year ends Oct. 30.

Year	Per Cent Earned on Capitalization	Per Cen Loss on Capitaliza
1925	5.61	....
1926	6.86	....
1927	5.22	....
1928	6.55	....
1929	9.88	....
1930	4.54	....
1931	0.40	....
1932	....	2.85
1933	....	0.90
1934	0.33	....

d Steel Industry for 1934

an Aggregate Annual Ingot Capacity of 62,846,488 Gross Tons

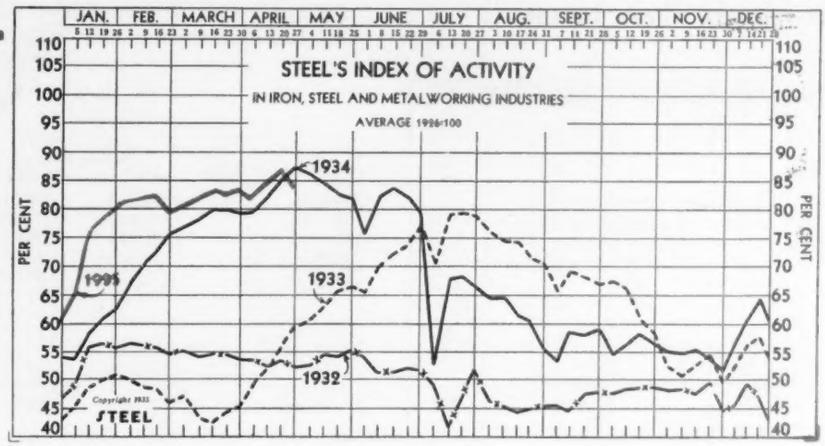
ırnings

Total Loss Before Div. and Int. on Bonds	Loss Per Share	Per Cent Total Loss on Capitaliz- ation	Loss Per Ton Ingot Capacity	Rated Ingot Capacity, Gross Tons	Capital- ization Per Ton Ingot Capacity	Total Assets	Current Assets	Current Liabilities	NAME OF COMPANY
$16,616,728	$5.39	0.85	$0.79	27,341,900	$71.18	$2,084,112,287	$420,122,302	$55,986,556	.....United States Steel Corp.
31,336,670	7.09	1.59	1.34	27,341,900	71.77	2,102,896,879	405,193,827	52,283,704	
7,354,393(x)	1.87	1.20(x)	0.06(x)	9,360,000	65.34	639,429,329	120,765,979	18,834,040	.....Bethlehem Steel Corp.
2,003,672	4.77	0.33	0.93	9,360,000	66.45	649,388,274	114,599,514	18,927,485	
169,531	3.43	0.07	0.69	5,013,000	47.71	262,487,431	43,257,718	13,750,812	.....Republic Steel Corp.
1,133,294	3.83	0.47	0.79	5,013,000	48.56	268,275,152	41,437,341	12,371,958	
3,327,357	13.50	1.96	0.91	3,660,000	46.29	181,532,641	40,352,417	4,806,870	..Jones & Laughlin Steel Corp
4,971,096	16.45	2.86	1.36	3,660,000	47.51	186,700,055	41,990,999	4,022,922	
1,704,263(x)	2.60	0.89(x)	0.55	3,120,000	61.32	205,848,899	61,111,987	10,031,398	Youngstown Sheet & Tube Co.
3,881,105	7.21	1.98	1.24	3,120,000	62.93	205,854,477	59,184,118	5,407,622	
8,020,793(x)	2.80(x)	5.49(x)	2.71(x)	2,232,000	65.37	156,436,119	41,509,117	7,576,624	.....National Steel Corp.
4,555,631(x)	1.30(x)	3.20(x)	1.26(x)	2,232,000	63.75	150,727,414	33,805,379	6,040,949	
3,238,472(x)	0.49(x)	3.29(x)	0.44(x)	2,431,720	45.01	107,803,776	30,960,200	7,585,016	.....American Rolling Mill Co.
1,471,604(x)	0.46	1.53(x)	0.31	2,200,000	43.62	111,550,195	29,022,687	10,570,459	
5,673,271(x)	3.10(x)	5.92(x)	1.86(x)	2,000,000	47.55	101,312,032	23,007,143	3,391,886	.....Inland Steel Co.
2,141,468(x)	0.14(x)	2.28(x)	1.07(x)	2,000,000	46.95	102,548,038	20,599,202	6,108,948	
1,914,393(x)	4.53	1.94(x)	1.27(x)	1,500,000	66.41	106,531,203	27,508,559	4,524,670	.....Wheeling Steel Corp.
1,164,139(x)	6.64	1.18(x)	0.78(x)	1,500,000	65.75	103,745,437	26,167,560	3,242,946	
760,850(x)	3.04	0.71(x)	0.09(x)	875,000	121.17	109,475,610	18,340,734	2,659,270	..Crucible Steel Co. of America
413,349(x)	4.01	0.39(x)	0.40	875,000	120.89	109,320,410	17,861,437	2,750,618	
1,277,711(x)	0.31	4.48(x)	0.68(x)	828,000	34.44	34,245,127	6,372,528	4,412,541	.....Otis Steel Co.
790,931	2.75	2.83	1.81	830,000	33.70	33,981,146	5,373,524	5,304,562	
234,021(x)	0.13(x)	2.16(x)	0.05(x)	840,000	12.89	13,044,162	3,351,517	2,238,274	.....§Lukens Steel Co.
264,786	1.45	2.47	0.55	840,000	12.74	13,261,277	3,608,676	2,238,274	
736,365	8.14	1.55	1.85	720,000	65.80	73,008,352	13,374,831	2,498,115	.....‡Pittsburgh Steel Co.
1,720,004	12.12	3.49	3.25	720,000	68.31	73,533,428	14,194,259	2,037,800	
835,928(x)	0.99(x)	4.33(x)	1.73(x)	482,000	35.21	26,576,894	5,746,556	1,121,404	.....Allegheny Steel Co.
292,017(x)	0.10(x)	1.58(x)	0.60(x)	482,000	38.40	29,077,335	5,589,594	1,091,005	
237,944(x)	0.85	0.89(x)	0.06	480,000	55.66	27,714,526	3,957,872	514,678	.....Gulf States Steel Co.
500,592(x)	0.63(x)	1.86(x)	0.55(x)	480,000	56.10	28,600,589	4,187,778	1,130,495	
301,211(x)	0.03	1.51(x)	0.02	450,000	42.85	21,576,383	4,538,299	1,627,013	.....Sharon Steel Hoop Co.
37,745(x)	0.73	0.19(x)	0.61	450,000	44.36	22,017,878	3,946,151	1,839,319	
258,761(x)	1.01(x)	2.76(x)	0.65(x)	400,000	23.44	9,915,766	4,570,637	339,964	.....Granite City Steel Co.
506,652(x)	1.99(x)	5.63(x)	1.27(x)	400,000	22.51	9,824,644	4,464,531	379,752	
569,062(x)	1.06(x)	5.01(x)	1.72(x)	280,000	42.12	13,462,281	5,313,436	1,336,573	.....‡Continental Steel Corp.
15,273(x)	1.48	0.14(x)	0.21	280,000	40.25	12,279,874	4,007,807	559,364	
632,591(x)	3.16(x)	5.42(x)	3.16(x)	268,000	43.51	12,260,675	4,789,893	472,041	.....Midvale Co.
28,349(x)	0.14(x)	0.19(x)	0.14(x)	268,000	57.14	15,639,801	7,827,227	161,974	
139,762(x)	0.50(x)	2.30(x)	0.44(x)	235,368	23.97	6,585,043	2,053,700	188,941	.....Laclede Steel Co.
4,837	0.20	0.09	0.17	235,368	24.05	6,591,005	1,878,559	176,278	
304,926	10.79	4.81	0.17	144,000	43.94	7,472,471	383,522	453,273	.....Scullin Steel Co.
609,325	20.90	9.23	2.27	144,000	45.85	7,490,969	270,557	518,163	
293,280(x)	1.42(x)	4.67(x)	5.11(x)	57,500	109.21	5,865,992	3,269,121	360,315	...‡Vanadium-Alloys Steel Co.
147,494	0.70	2.41	2.38	62,100	98.19	6,310,380	3,008,236	176,134	
442,348(x)	0.39(x)	6.43(x)	11.64(x)	38,000	180.91	7,252,891	3,171,936	378,478	.....Ludlum Steel Co.
161,063(x)	0.66	2.36(x)	4.24(x)	38,000	179.77	7,050,653	2,797,985	219,236	
$12,734,147(x)	$0.66	0.33(x)	$0.27	62,846,488	$62.28	$4,213,949,890	$887,830,004	$145,088,752	1934..... Totals
35,575,332	2.54	0.90	$1.04	62,531,368	63.15	4,256,665,310	851,016,948	137,559,967	1933

(x) Earnings.
‡ Fiscal year ends June 30.
§ Fiscal year ends Oct. 30.

Per Cent Loss on Capitalization
....
....
....
....
....
....
....
2.85
0.90
....

THE BUSINESS TREND



STEEL's *index of activity in the iron, steel and metalworking industries declined 1.6 points to 84.7 in the week ending April 27:*

Week ending	1935	1934	1933	1932
Mar. 2	81.1	78.8	47.4	54.1
Mar. 9	82.0	78.6	43.4	54.8
Mar 16	84.0	79.9	42.7	54.4
Mar. 23	84.0	79.7	44.6	53.5
Mar. 30	8.3	79.3	45.2	53.4
April 6	83.4	79.6	49.1	52.6
April 13	85.4	82.2	52.6	53.4
April 20	86.3†	85.0	55.8	52.3
April 27	84.7*	87.5	59.5	52.5

†Revised. *Preliminary.

The index charted above is based upon freight car loadings, electric power output, automobile assemblies (estimated by Cram's Reports) and the steelworks operating rate (estimated by STEEL). *Average for 1926 equals 100, weighted as follows: Steel rate 40, and car loadings power output and auto assemblies each 20.*

Conflicting Factors Obscure Outlook for Activity

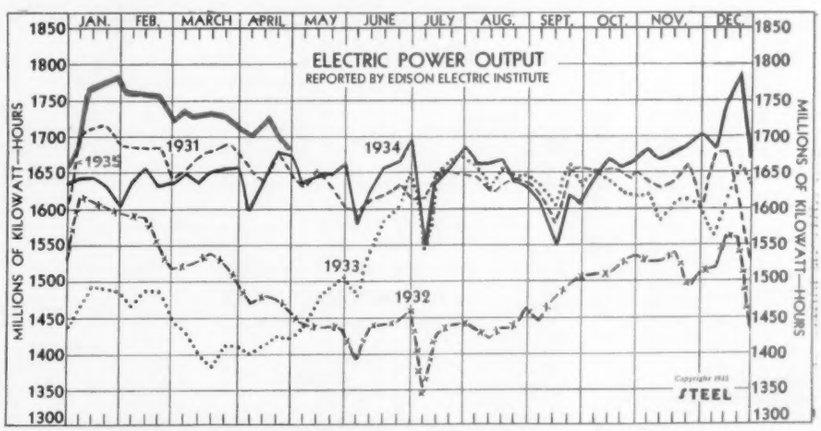
THE beginning of the fifth month finds business still in the grip of an indefinite, sidewise movement. Fluctuations from week to week appear to be somewhat wider than they were in the first quarter, but the general trend remains almost horizontal.

Most of the changes in the last full week of April were unfavorable. Automobile production in the week ending April 27 continued upwards, but the gain was slight. Revenue car loadings dropped sharply, indicating that the relatively heavvy shipments of the previous week has been stimulated unduly by the imminence of higher rates. Steelworks operations remained steady, and last week were easing off slightly. Electric power output continued its seasonal slide.

As a result of these movements, STEEL's index of industrial activity dropped from 86.3 to 84.7. For three consecutive months the index, which is not adjusted seasonally, has fluctuated within narrow limits in the eighties. During that time its general trend has been level or faintly upward. The Federal Reserve board's index of industrial production, which is adjusted seasonably, has drooped slightly in that period. It stood at 90 in January, 89 in February, 88 in March 86 (estimated) in April. Both indexes confirm our recent assertion that industrial activity has established a "plateau of stability."

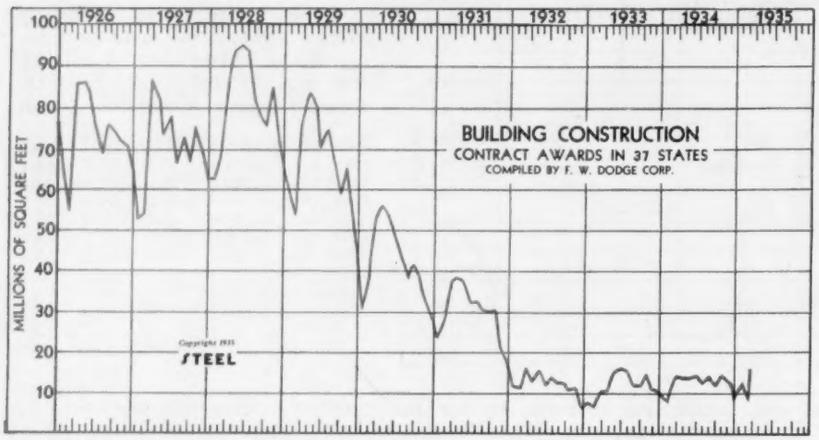
Significant developments last week included an apparent spread of the Toledo labor infection, increased confusion in Washington as to government policy, and more outspoken expressions by business against the economy of scarcity. These conflicting factors obscure the business outlook.

Million Kw.....Hr. 1935	
Apr. 27	1,673
Apr. 20	1,701
Apr. 13	1,725
Apr. 6	1,700
Mar. 30	1,712
Mar. 23	1,824
Mar. 16	1,728
Mar. 9	1,724
Mar. 2	1,734
Feb. 23	1,728
Feb. 16	1,760
Feb. 9	1,763
Feb. 2	1,762



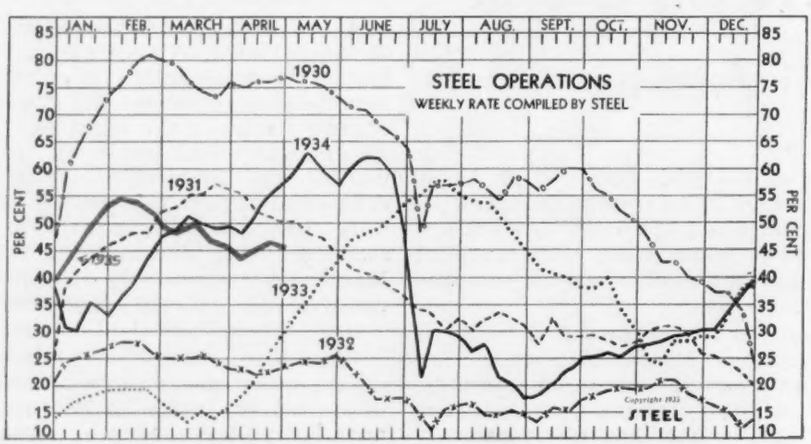
Million Kw.....Hr. 1934	
Apr. 28	1,669
Apr. 21	1,673
Apr. 14	1,642
Apr. 7	1,616
Mar. 31	1,665
Mar. 24	1,658
Mar. 17	1,650
Mar. 10	1,647
Mar. 3	1,658
Feb. 24	1,646
Feb. 17	1,640
Feb. 10	1,651
Feb. 3	1,636

March Building Trend Shows Sharp Upturn



	Square Feet	
	1935	1934
January	11,245,100	9,568,700
February	9,670,300	8,176,300
March	15,873,100	14,788,900
April		14,207,100
May		14,664,400
June		13,986,500
July		13,250,000
August		14,259,000
September		12,510,300
October		15,098,100
November		12,780,300
December		9,193,300

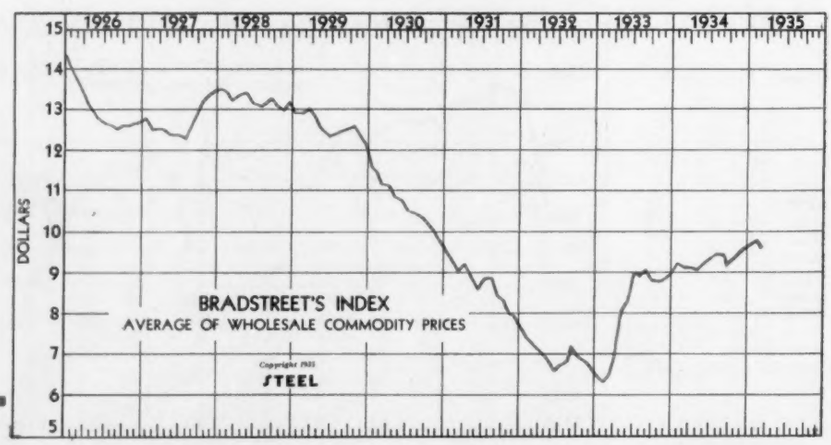
Steel Operating Rate Moves in Narrow Range



1935	Per Cent
April 27	46
April 20	46
April 13	45
April 6	44
Mar. 30	45
Mar. 23	46
Mar. 16	48
Mar. 9	50
Mar. 2	48
Feb. 23	50
Feb. 16	53
Feb. 9	54.5
Feb. 2	54.5

1934	Per Cent
April 28	57
April 21	55
April 14	51
April 7	48
Mar. 31	49
Mar. 24	49
Mar. 17	50
Mar. 10	51
Mar. 3	48
Feb. 24	47
Feb. 17	43
Feb. 10	39
Feb. 3	36

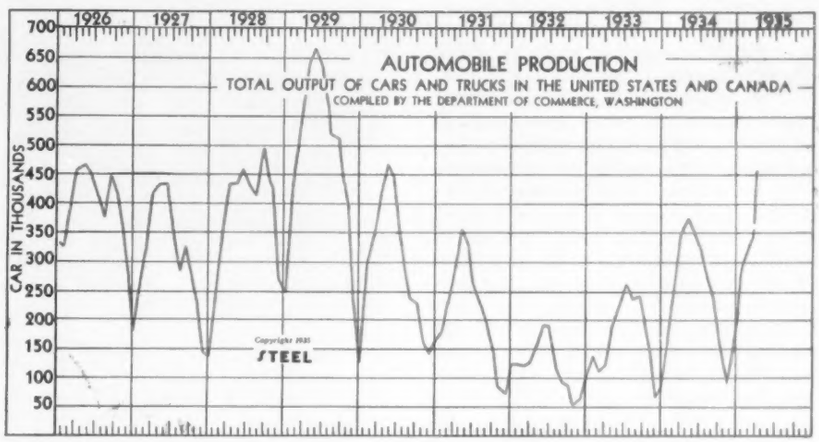
Bradstreet's Index Declines on April 1



	1935	1934
January 1	$9.49	$9.01
February 1	9.78	9.26
March 1	9.79	9.17
April 1	9.66	9.16
May 1		9.14
June 1		9.24
July 1		9.32
August 1		9.48
September 1		9.45
October 1		9.27
November 1		9.29
December 1		9.49

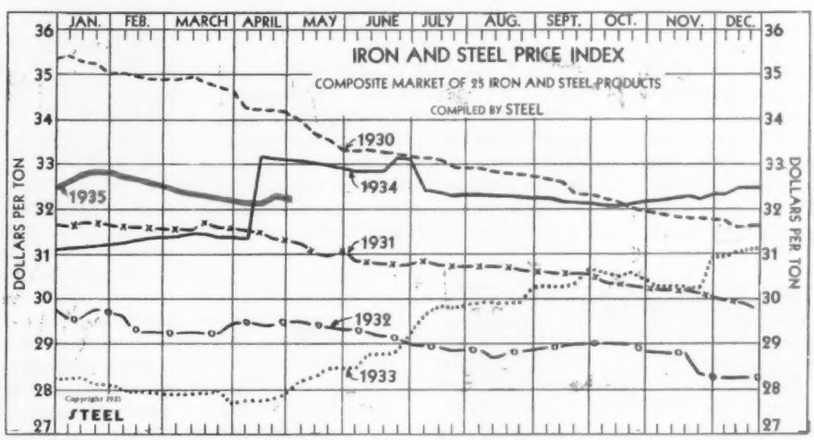
Automobile Output Highest Since 1930

	1935	1934
January	303,372	162,570
February	358,658	238,827
March	451,805	352,614
April	.....	371,338
May	.....	350,616
June	.....	320,382
July	.....	276,047
August	.....	244,715
September	.....	175,586
October	.....	135,771
November	.....	85,179
December	.....	156,356



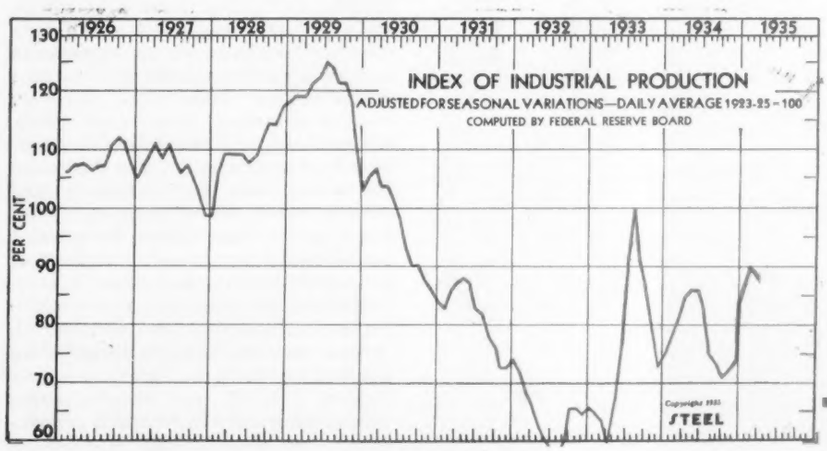
STEEL'S Price Composite Off 1 Cent to $32.30

1935	
April 27	$32.30
April 20	32.31
April 13	32.27
April 6	32.27
Mar. 30	32.30
Mar. 23	32.33
Mar. 16	32.38
Mar. 9	32.39
Mar. 2	32.42



1934	
April 28	$33.09
April 21	33.12
April 14	33.15
April 7	31.33
Mar. 31	31.34
Mar. 24	31.34
Mar. 17	31.42
Mar. 10	31.43
Mar. 3	31.36

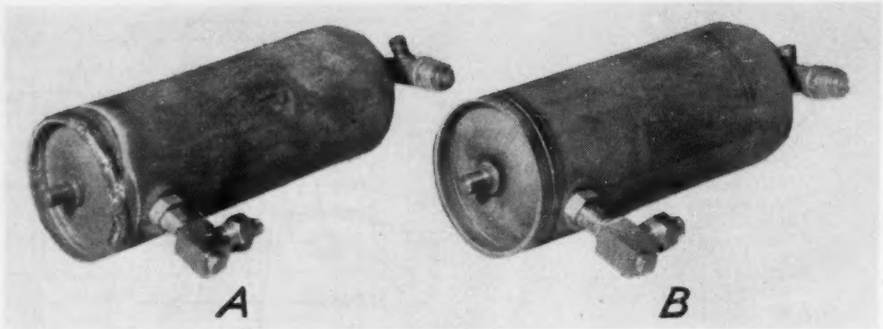
Industrial Production Declines in March



	1935	1934	1933
January	91	78	65
February	89	81	64
March	88	84	60
April	....	86	67
May	....	86	77
June	....	83	91
July	....	75	100
August	....	73	91
September	....	71	84
October	....	73	77
November	....	74	73
December	....	86	75

Production of Refrigerator Parts Is

Part I



BY A. E. HACKETT

Detroit Representative, Thomson-Gibb Electric Welding Co.

MASS production had its origin in the automotive industry and until this new industrial giant struck its stride every manufactured article was produced under conditions peculiar to its own particular industry. The automobile engineer of the earlier day was obliged to venture carefully along new paths because no yardstick was available by which he could determine the best course. Much pioneering, therefore, was done in the automobile industry and eventually the results found their way into other lines, many of which had no similarity.

Processes Are Adapted

The mechanical refrigerator industry, which has grown by leaps and bounds during the past few years, quickly availed itself of much information developed by automobile manufacturers. Today, we find in the manufacture of mechanical refrigerators many processes identical to those used in the automobile field with such modifications as are necessary for slightly and in some instances vastly different conditions from those encountered in the building of automobiles.

The purpose of this article is to point out some of the latest developments in mechanical refrigerator construction, laying particular stress on the application of electric welding. Unusually noteworthy is the practice of the Kelvinator Corp., Detroit and Grand Rapids, Mich., which has obtained excellent results in several specific operations involving the use of electric resistance welding.

One phase of refrigerator work which sets it apart from other industries using the resistance welding process is the absolute necessity for welds to withstand high internal and in a few instances external pressures. Some refrigerants, while disagreeable to the olfactory nerve, may not be poisonous; other refrigerants are. In any event, those portions of the refrigerator charged with the refrigerant must be absolutely tight to prevent its escape into the refrigerator itself, and its subsequent passage outside.

Sulphur dioxide (SO_2), also methyl chloride and Freon are used in Kelvinator refrigerators and every precaution is taken to prevent even the most minute leaks. The use of resistance welding has played no small part in insuring this condition over former practices and added advantages are gained because of the improved appearance of the parts, the larger quantities in which they can be produced over former methods, and the greater assurance that the parts are less liable to failure.

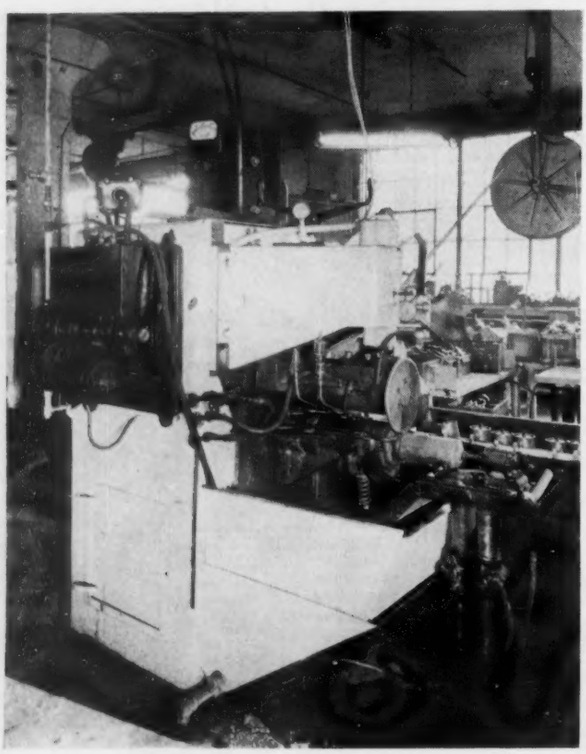


FIG. 1—Seam welding the bottom stamping to the liquid receiver cylinder. The 200-kilovolt-ampere circular seam welding machine is equipped with a specially-designed work holding fixture, shown in greater detail in Fig. 4. The operation is entirely automatic once the cycle is started and the 12 inches of welding is completed in about 40 seconds. Average production is 100 to 105 receivers per hour

Oxidation Is Objectionable

Prior to the installation of equipment for resistance welding, the electric arc or oxyacetylene processes had been used on several important units. These processes, however, created conditions which proved detrimental to the operation of completed refrigerators. For instance, the heated area of the piece being welded could not be confined within sufficiently close limits to prevent oxidation of the metal. Oxidation, or scale, on the outside was most objectionable in that considerable effort was required for its removal. To prevent scale from forming on the inside of certain parts, a quantity of alcohol was inserted; this proved effective but retarded production, was messy, and was some-

Speeded by Resistance Welding

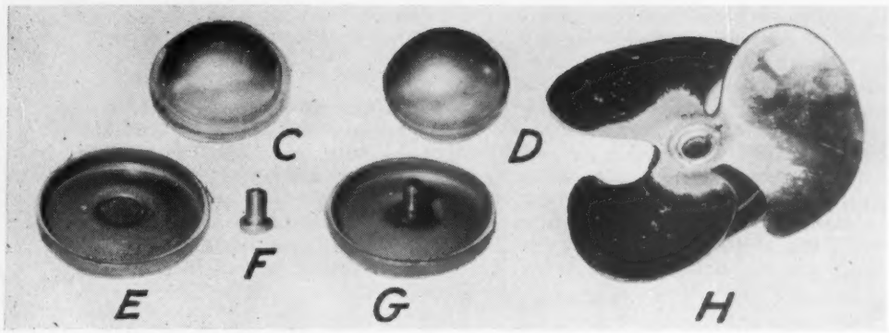


FIG. 2—Various electric refrigerator parts fabricated by electric resistance welding. A is an arc welded liquid receiver and B is a resistance seam welded receiver. C shows the ball float in the as-welded condition and D the same float after the welded flange has been trimmed. E shows the blank for the liquid cylinder bottom, F the stud to be welded to the blank and G the welded assembly. H shows the fan to which is welded a forged steel hub

thing to be avoided if at all possible.

With both of the welding processes just mentioned, another serious disadvantage quickly developed. Because it was impossible to confine the heated area close to the weld, the metal became annealed for a considerable distance from the weld. The annealed area varied in size, depending upon the skill of the operator handling the gas torch or the electric arc. This condition became as serious as the formation of scale for the reason that under the pressures which various parts were obliged to withstand they frequently would bulge out of shape because the material had been softened. Resistance welding eliminates these two objections, and its adoption has resulted in a superior product.

Steel the Common Material

In the manufacture of various refrigerator units, a wide variety of metals can be employed successfully, particularly when resistance welders of the latest designs are used. The material most commonly used is ordinary steel in various finishes. Ordinary soft drawing stock, cold rolled and pickled, or full finished material is used to good advantage. Stainless steel of numerous grades is being welded satisfactorily. Certain grades of brass can be welded in the same manner, however, care must be taken to keep the zinc content within limits that will insure a satisfactory weld.

Because of certain peculiarities which material with a high iron content possesses, it is used exclusively for evaporator units made by the Kelvinator Corp. This material lends itself readily to porcelain enameling. Unless specifically mentioned, the various refrigerator units which are to be described are made either of porcelain enameling iron or a good grade of deep drawing cold rolled stock.

One of the most interesting applications of electric welding in the Kelvinator plant is in connection with the liquid receiver cylinder, shown in Fig. 2, *A* and *B*. These receivers are approximately 4 inches in diameter and 12 to 15 inches in height, depending on the type and size of refrigerator in which they are to be installed. It is necessary that an absolutely tight joint be made at every point where any part is attached to this cylinder, and it is also essential that the inside surface be kept free from scale and other surface imperfections which would be detrimental to the proper functioning of the refrigerating unit.

Cylinder Is Seam Welded

The cylinder is made from a single piece of deep drawing soft steel stock. The wall thickness varies slightly from the drawing operation but is approximately 1/16-inch, at least where the bottom is seam welded to it. The bottom piece is a single stamping made of ⅛-inch stock with a ½-inch flange around its circumference to which the shell is seam welded. No particular preparation of either part is required before seam welding, although the inside surface of the shell is scratch brushed as a precaution. Next, the ball float and valve are assembled inside the receiver; the bottom stamping is pressed into place under a hand-operated arbor press, and the assembly goes to the seam welding machine.

Before describing the resistance seam welding operation in detail, a few comparisons with arc welding

FIG. 3—This 150-kilovolt-ampere welding press is equipped with dies and fixtures to handle three distinct operations. In the upper die, at the left of the operator's hand, the stud is welded to the liquid receiver bottom stamping. The same fixture is used for welding a forged steel hub to fan, as shown. In the lower fixture, a steel spud is welded to the top of the liquid receiver cylinder

are in order. Maximum production with arc welding was in the neighborhood of 37 to 40 pieces per hour and of this number a high percentage developed leaks in the test tank. Leakers were returned to the arc welder and in numerous instances still leaked when they reached the test tank the second time.

Effects of High Heat

With the arc weld it was not possible to prevent heat radiating fairly high along the shell, which is of lighter material than the bottom. This condition is plainly shown in the illustration of the arc welded shell, Fig. 2*A*. This excessive heat formed scale on the inside which of course could not be removed after the end had been closed. To minimize scale accumulation, a small quantity of alcohol was placed in the shell prior to welding to keep the surface reasonably clean even though excessive heat along the lower edge could not be avoided.

Aside from the limited production with this process and other difficulties that followed its use, another serious objection was the unsightly appearance of the weld itself. Metal deposit was not uniform and large accumulations sometimes would occur. This was particularly noticeable on those assemblies which were found to leak and which were afterwards patched. It is estimated, and the figure is considered conservative, that it cost 2½ cents each to arc weld the bottom in this receiver shell.

The seam welding operation is done on a Thomson-Gibb circular seamer equipped with a transformer of 200-kilovolt-ampere capacity, and operating on 220-volt, 60-cycle, single-phase current. This outfit with its specially designed work holding fixture is shown in Fig. 1. A close up view of the fixture, the special lower wheel drive, and the part in position for welding, is clearly shown in Fig. 4. A small air cylinder is used to force the receiver shell against the end of the shaft on which the lower welding wheel is mounted, the lower roll being counter-bored to clear the stud that is assembled to the bottom piece in a previous operation. To provide for a positive drive the lower roll is gear driven, the upper roll being friction driven; the welding surface is kept clean and uniform by the driving action of the friction roll.

The operation is entirely automatic once started by the operator. The work clamping cylinder is actuated by a foot-operated air valve placed on the floor. Depressing another valve brings the upper head into position, automatically starting the welding cycle. While the part is making one complete revolution the operator assembles a valve in the top of the cylinder just welded.

Operation Rapid; Production High

Each liquid receiver cylinder requires approximately 12 inches of welding; the time for the operation is in the neighborhood of 40 seconds. Average production is about 100 to 105 pieces per hour, although on several occasions hourly production has somewhat exceeded this figure. It is interesting to note that resistance seam welding produces very few leakers; it is not uncommon to operate several days at a stretch without one being found. In event of a small leak, the receiver is merely returned to the welder and re-worked without spoiling its appearance because of the second weld.

Tested by Compressed Air

All liquid receivers are given a compressed air test of 200 to 225 pounds with few cylinders failing under it. It has been conservatively estimated that the cost of electric current for welding these cylinders is roughly 1/3-cent apiece.

Careful examination of the seam welded cylinder, Fig. 2*B* indicates only a slight discoloration along the weld line in the cylinder body. The heat, however, is not sufficient to cause scale to accumulate on the inside. The only precaution taken to prevent heat radiating along the shell is to keep a stream of water playing on the work, this being known in welding practice as "flood cooling". After the receiver is sprayed with black enamel paint, the weld is hardly noticeable, which adds to the appearance of the unit in which it is assembled.

The bottom piece for the liquid receiver has a stud attached to it for anchoring the cylinder securely to the flange in which the assembly is installed. This is clearly shown in Fig. 2*G*. Former practice was to braze the stud to the stamping, and, to produce the required quantity, the

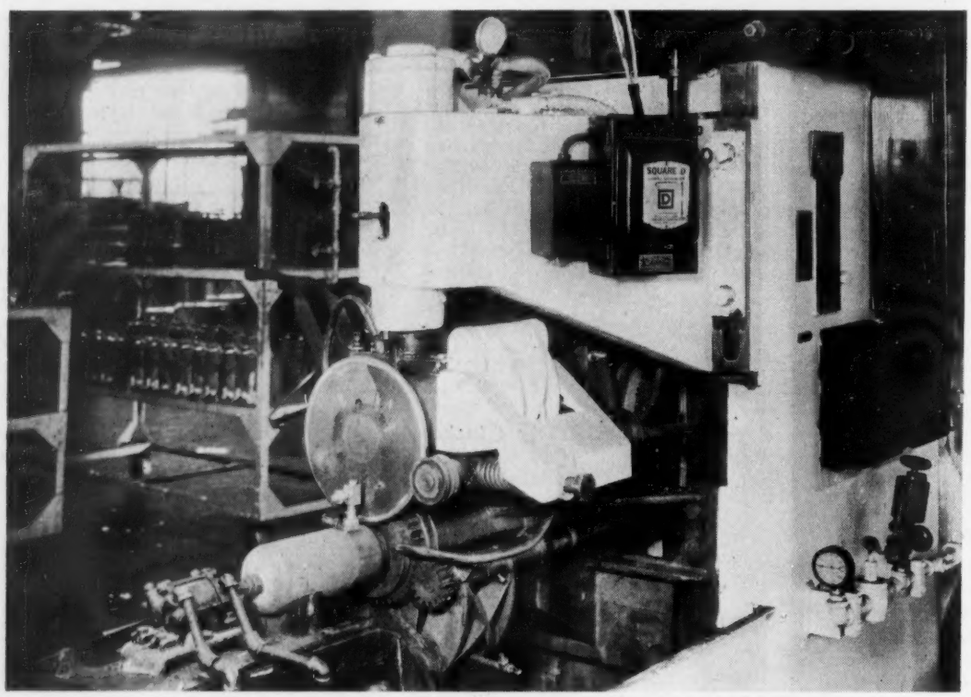


FIG. 4—A close-up of the fixture, shown in Fig. 1 for seam welding the bottom stamping to the liquid receiver cylinder. A small air cylinder forces the shell against the end of the shaft on which the lower welding wheel is mounted. The lower roll is gear driven and the upper roll is friction driven. The weld causes only slight discoloration in the cylinder body, and the heat is insufficient to form scale on the inside of the cylinder

operation was carried on continuously through three 8-hour shifts. Aside from the cost of acetylene gas, and spelter and labor, the parts when carelessly applied were more or less mussy with spelter which ran over to the inside flange. It was necessary to remove this surplus material before the electric welding operation was performed.

Press Handles Three Operations

Installation of the 150-kilovolt-ampere Thomson-Gibb welding press, Fig. 3, with dies arranged to handle three distinct operations, facilitated this operation. The liquid receiver bottom, Fig. 2*E*, is dropped into the die and fixture at the left of the operator's hand after the stud, Fig. 2*F*, is placed in position in the bottom of the die. The under side of the head contacts the welding electrode. When the foot treadle is depressed, the upper head contacts the inner side of the cylinder bottom stamping and the weld is completed automatically.

Whereas the brazing operation required continuous 24-hour production to meet requirements, the press welder needs to operate only 2½ or 3 hours per day to supply demand. Production averages in the neighborhood of 600 pieces per hour and the cost of electric current is only a fraction of that formerly spent for acetylene gas, not to mention brazing compounds and additional labor for welding and subsequent cleaning of parts before final assembly.

The same fixture which is used for applying the stud to the cylinder bottom also is used for welding a forged hub to the fan blades, as shown in Fig. 2*H*. Fig. 3 shows one of these assemblies in position and these are welded at about the same speed as the cylinder bottoms.

Design Is Simplified

The top of the liquid receiver shell is reinforced with a steel spud threaded to receive a brass fitting. Until recently this spud was brazed with an acetylene gas torch, however, the number of pieces which could be produced was limited and the operation rather costly when spelter, gas, and other materials were taken into account. Some experimental work was done in connection with electric welding the part with a shoulder on the spud brought through a hole in the top of the shell and a ring projection on the wider part inside. For a time this looked like a satisfactory arrangement, the finished part was neater in appearance and production many times greater than by brazing. A later development, however, reduced the assembly to a very simple and at the same time a very positive procedure.

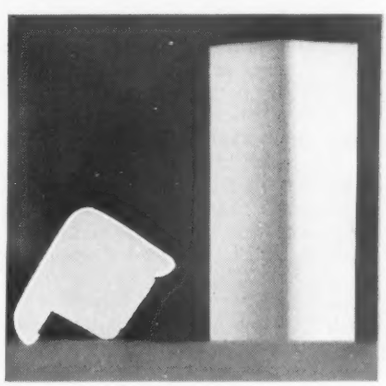
Fig. 3 shows a round fixture mounted on the lower knee of the welding press and tilted so the work will clear the upper die for loading and unloading. It is no longer necessary to punch a hole in the top of the shell. The spud is placed in a recess in the lower die, the cylinder slipped into place and with the handle shown in the illustration the operator tilts the die into position bringing the top of the shell directly under the upper electrode. The welder head then goes through its cycle, leaving the spud securely welded on the inside. From the welder the shell goes to the next station in the production line where a hole is drilled through the shell into the spud, and in the next operation the spud is tapped for the brass fitting which is afterwards soldered in place to insure its being absolutely tight against leakage.

The top spud welding operation is performed on the same outfit which attaches the stud to the under side of the liquid receiver shell bottom and production averages about 300 pieces an hour, which is many times faster than the parts could be brazed. Particular attention is called to the arrangement of the lower die, Fig. 3. The two distinct and quite different operations are done with nothing more than a very simple change in the setting. To change from one operation to the other, it is only necessary to remove four cap screws which hold one die and locating fixture in place. The die and fixture are set back out of the way so water connections are not disurbed and not over 5 minutes are required for making the change.

(To be concluded)

Composite Molding Formed by Drawing 18-8 Stainless Steel Over Wood Core

COMPOSITE molding, formed by drawing 18-8 chromium-nickel stainless steel over a wood core, has been developed by Charles F. Biele & Sons Co., 33-39 Bethune street, New York. It is used for mirror frames, baby carriages, refrigerators, clocks, display cases and for furniture trim. It is being employed extensively in New York in decorating bar-rooms, hotels, restaurants, newsstands, railroad stations and other public buildings.



New molding, covered with stainless steel, is used for decorative trim in buildings, on furniture and in many other applications

It is furnished in approximately 1500 different patterns including half, quarter and three-quarter rounds, flats and others. Where standard patterns do not meet requirements the company is prepared to design special patterns. Features of the new molding are its clean-cut profile and its highly polished surfaces.

Wood planks are slit into suitable widths and thicknesses and run through a straight molding machine provided with revolving cutters at top, bottom and both sides, so that the wood emerges as profiled molding. It is necessary to make the section to accurate dimensions so as to fit in the steel drawing die rather tightly.

Pulled Through Drawing Die

Stainless steel, 0.012 and 0.016-inch thick, is slit to proper width from wide rolled sheets. These strips, together with the wood cores, are tapered at one end to a point for insertion in the drawing die. Tongs on the drawing carriage grasp this point and pull the point through the die, thus drawing the steel around the wood. The molding is formed in lengths of 8 to 16 feet, depending on the length of the original planks. The points represent wastage inasmuch as they have to be cut off.

Success in obtaining a high finish depends first on drawing so as to have a minimum amount of die marks, and then on the polishing operation itself. Polishing is done on ordinary buffs. Some of the smaller sections are mounted on grooved sticks to stiffen them while polishing. This light material will not stand heavy polishing and if heated beyond a certain temperature will develop a wavy surface. The polishing operation causes the metal to creep slightly so that for accurate work the molding is not cut until after the polishing has been completed.

THIS 3-car, light-weight, streamlined train will operate between Boston and Providence and is the first equipment of its kind to be purchased by a New England railroad. Powered with two diesel engines driving electric generators, it will make the 44-mile run in 44 minutes

Streamlined Train for New England Utilizes Weight-Saving Materials

THE first light-weight, streamlined train designed to travel short distances was delivered to the New York, New Haven & Hartford railroad April 29. This train was built for 44-minute operation between Boston and Providence, a distance of 44 miles, and is the first of its kind in the United States. It was designed to meet particular New England conditions where distances are relatively short and traffic is dense.

An ultra-modern three-car, light-weight train, streamlined throughout, the Comet, as it will be known, embodies all latest improvements. Many of the features were designed and adopted especially for this train. Engines are installed in both end-cars, thus it will be unnecessary to turn the train around. Both engines are operated simultaneously by a master control.

The train, the first light-weight equipment of its kind to be acquired by any railroad in New England, was built by the Goodyear-Zeppelin Corp., Akron, O., the order having been placed early in 1934. Built from funds advanced by the railroads division of PWA, the total cost was approximately $250,000.

The streamlined design was developed after exhaustive tests had been made on models in the wind tunnels at Columbia university, New York, and the Daniel Guggenheim Airship institute, Akron, O. The problem was to design the front and rear ends for a tubular center section so that the train as a whole would move through the air with the least air disturbance. The solution is a symmetrical train with no sharp corners, the headlight and marker lights being streamlined into the whole unit. Doors and steps when closed become a part of the unbroken exterior surface of the train. Windows are flush with the outside of the train, rivet heads have been cut down in height as far as possible without impairing their strength, the spaces between the cars have been covered with a specially-prepared weather-resisting and elastic rubber sheeting. Carrying the idea still further, bottoms of the cars have been made smooth and the trucks have been placed as far up inside the car-body structure as possible.

40 Per Cent Weight Saving

Ready to run, the Comet weighs approximately 126 tons, which is about 40 per cent less than a conventional steam-train of equivalent passenger seating capacity. It is not the lightest train that could be built but it is an intermediate weight train of advanced design which is intended to meet railway requirements by combining passenger safety and comfort with low operating and maintenance cost.

Reduction in weight was accomplished by a departure from the conventional type of car construction and the substitution of an aluminum alloy for steel without sacrifice in strength. Each car is built like a tube, the tube being the safest and most efficient design. The entire framework is covered with heavy gage aluminum sheets. These form a complete shell, reinforced by the framework, window posts and bulkheads. The front ends are so designed that they may be removed and replaced without reducing the strength at the point of connection.

While aluminum alloy was used in the construction of the car bodies and frames, cast steel was used in the trucks and steel in the wheels. Use of aluminum in the frames and coverings of the cars reduced the weight materially and permitted the use of larger sections, thus adding to safety. An additional advantage in aluminum alloys is a high resistance to corrosion; this feature is highly important as the train will operate close to the Atlantic seaboard.

The power plant consists of two oil-burning diesel engines, one located in each end of the train. These are identical 400 horsepower, 6-cylinder engines, weighing approximately 30 pounds per horsepower. They were built by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Each engine drives a generating unit consisting of a main and auxiliary

generator. Current from the main generators is transmitted through various switching and control devices to operate the motors which are geared to the car truck axles. Auxiliary generators supply electricity to operate the air conditioning motors, the lighting system, air compressors and all other equipment.

Although both engines normally will be in operation and are necessary to enable the train to make the required speeds and to maintain regular schedules, in case one engine stalls the other will furnish sufficient power to run the train at a speed of about 70 miles an hour.

The train is 207 feet long, 9 feet 10¼ inches wide and 10 feet 11 inches high, except for the engine room which is 11 feet 3 inches high. The bottoms of the cars are but 10 inches above the rails. This reduction in height, accomplished by lowering the superstructure on the trucks, serves to bring the center of gravity approximately 20 inches nearer the rails and increases safety at high speeds.

The two end cars containing the power units in the forward sections are each 74 feet 2 inches long. Each of these cars has coach compartments back of the engine rooms and seats 48 passengers. The center car, which is 58 feet 8 inches long, seats 64 passengers, making a total seating capacity for the train of 160. Interiors of the cars are of ordinary width.

Car Weather Controlled

With a special air conditioning system, including refrigeration capacity equivalent to 14 tons of ice in 24 hours, passengers are assured of comfort regardless of weather conditions. There are two air conditioning units in each car, located directly over the doors. Ducts are provided on each side of the cars for distribution of the air. Blowers deliver air to the ducts in both directions from the centrally located air conditioning units. A heating coil is provided in each air conditioning unit which serves to heat the car in cold weather. There are also facilities to supply steam heat in the conventional manner to be used in conjunction with the air conditioning system in extremely cold weather. Steam is supplied to the heating system by an oil-fired boiler. Temperatures in all cars are thermostatically controlled.

Being an articulated train, the rear end of one car and the front end of the next car rest upon the same truck, thus only four trucks are required for the three cars. All the journals run in roller bearings.

Suspension of the cars is different from anything heretofore used in railway cars, hydraulic shock absorbers being used in place of the usual leaf or elliptical springs. Trucks are orthodox steel castings, but the car bodies ride on coil springs contained within the shock absorbers. This curbs any tendency on the part of the cars to oscillate and also restrains side sway. These shock absorbers are an adaptation of those used on aircraft landing gear.

Seats are framed in aluminum and are of the so-called "walkover," quickly reversible type. Window sills or caps are of a bakelite veneer. Hardware is of aluminum, with a natural satin finish, including the baggage rack, moldings and curtain carriers. The floor is of cork with a rubber covering.

Brakes Assure Quick Stop

The Comet is equipped with a new type of air brake specially designed by the Westinghouse Air Brake Co., Wilmerding, Pa., for high-speed trains, with a braking rate three times greater than is common in ordinary trains. An important feature of the brakes is their automatic deceleration, which is set at the rate of 4 miles an hour a second. Thus, when traveling at 100 miles an hour, the train can be brought to a dead stop in 25 seconds. All parts of the brake equipment are constructed of light weight materials.

In exterior appearance, the streamlining is accentuated by alternate wide bands of brilliant blue and shining aluminum, extending the entire length of the train. The roof is finished in gray enamel closely matching natural tones of the aluminum alloy. A clear varnish coating is used to protect the shiny aluminum finish from tarnishing.

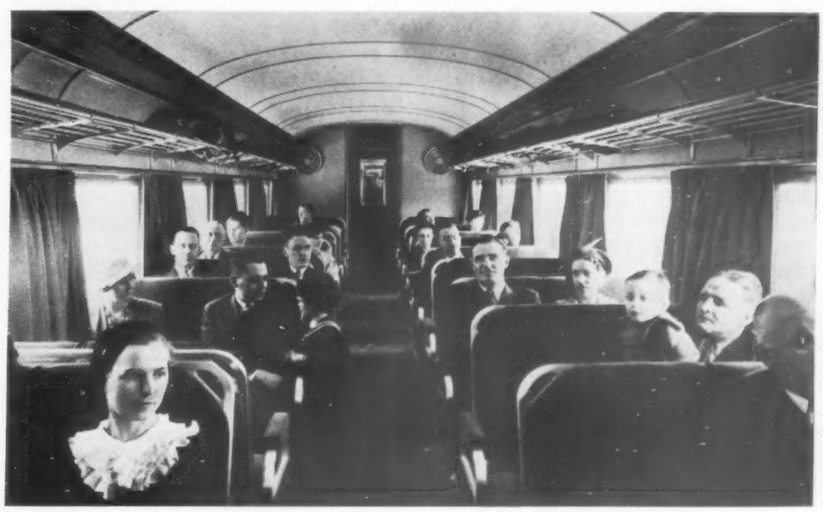
The Comet was designed so that the outer shell, or skin, would be a stress carrying element. The square body tube is reinforced at the four rounded corners by four longitudinal booms, or keels, which run the entire length of the car. This reinforcement not only adds to the bending and collision strength of the body, but offers maximum protection in case of derailment and overturning. The four corners are then connected by posts on the side, floor members in the bottom and carlines in the roof, where longitudinal channels provide further support of the sheeting.

At the points of articulation, this aluminum alloy body structure is connected by a heavy aluminum alloy bulkhead, the bottom part of which is formed by a welded high tensile steel endsill. This endsill ties in with the lower booms and distributes the loads from the center bearing and side bearings, which are integral parts of the endsill, into the end bulkhead and car body. The endsill, therefore, is the connecting link between car bodies and trucks.

Considering the weight of the car body structure, in relation to total weight of the train, including power plant, trucks and equipment, the structure of the three cars represents approximately only 20 per cent. Thus reinforcement of the car body affects the total weight of the train only slightly.

Indirect Lighting System

The upper boom sections have been utilized as air ducts for circulating and distributing the air for the air conditioning system. The extruded aluminum alloy lighting troughs, used for indirect lighting car interiors, also are attached to these upper booms running the full length of the compartments. Further strength has been built into the bodies of the cars through the arrangement of the vestibules and entrances provided in the center of the cars. The center vestibule is formed by two heavy diagonally braced



Metal plays an important part in car interiors. Ceilings and sidewalls are of aluminum, as are also the seat frames, baggage racks and other hardware. Each car is fully air conditioned and has indirect illumination

bulkheads near the center of the car body.

By arranging the door cutouts near the center, where the shear has its lowest value, instead of near the end supports where the shear is greatest, the shear deflection is reduced appreciably and the strength of the connection between the end bulkhead and the end sill could be fully maintained. This makes it possible to make the sturdy bulkheads at the ends of the car at the points of articulation tie in the welded steel end sill with the side walls, roof and the four corners into one integral unit. Diagonal members in the side walls stiffen the corners of the end bulkhead and help carry the stresses of shock up into the circumference of the tubular car body or shell.

The floor, or underframe, of the car is similar to a ship's double bottom. The underside is formed by the outer skin. The two lower boom sections are connected by lateral bulkheads about 21 inches deep in the center, which are braced by longitudinal bulkheads, forming a series of rectangular compartments in which various parts of the equipment are located. The roof structure is formed by pressed bulkheads connecting the two upper corner booms, braced longitudinally by six intermediate purlines, all covered with heavy sheeting capable of standing a high compression load, which forms the outer skin. The unusually heavy sheeting used, and the small size of the panels, makes the roof extremely rigid and capable of carrying a heavy bending load without wrinkling.

Reinforced Floor Structure

On both ends of the center car and the articulated end power car, the standard floor structure has been reinforced with a welded high-strength steel endsill. This endsill not only combines center and side bearings, but also ties in with the end bulkheads, side booms and the floor structure of the car. The buffing load is carried directly through diagonals and heavy shear plates into the lower side girders, while the vertical force is transmitted into the end bulkheads. The endsills are welded into one unit of high-strength steel with all brackets for tying in with the rest of the structure.

The large windows are separated by window posts of 24-inch depth to assure a good shear connection, and the panels next to the end bulkheads are especillay wide and braced diagonally, to transmit the impact of possible collisions into the top and bottom boom sections.

The two end cars have the same type of construction as the center car, except for the extreme ends, in which the power plants are housed. In the engine room the underframe has been replaced by a welded steel bed plate about 20 feet in length, which rests on the two lower boom sections, which have been especially reinforced in this area. The bed plate is 11 inches deep, formed by a top and bottom plate reinforced with longitudinal and transverse bulkheads, which provides a series of compartments to be used for the storage of fuel, lubricating oil and water.

Details of Bed Plate

Integral parts of the bed plate are the body bolsters, center bearings, engine and generator supports (the bed plate forms the lower half of the crankcase), supports for various accessories, such as air compressors and air conditioning compressors. All brackets required for the structural connection, the main bulkhead at the body bolster and the connection to the rounded front end of the car, also are welded to the bed plate. To facilitate removal of the engine when necessary, the center section of the roof directly over the engine mounting is removable.

Each end of the train, forward of the power plants, involves a design which contributes to extreme rigidity. The two lower longitudinal booms which run the length of the car, are formed into an arch at the very tip of the car, and riveted into a welded steel structure. The lower portion of this welded steel member forms the pilot (cow catcher) and the rear portion is connected to the floor structure, and a heavy shear plate. On the top, it is connected to a heavy front post.

This welded steel structure also forms the pocket for the stationary draft gear and a removable coupler which is carried inside the train when operating under its own power. The front post is tied in with two arches comprised of extensions of the upper and lower edges of the window frame girders, and on the top, flares out in the form of a "Y" into the two upper boom sections, which are arched to meet with it.

The entire framework is covered with heavy formed sheet covering, as is also the bottom. This results in a complete shell reinforced by the framework, window posts and additional bulkheads. The front ends are designed so that they may be removed at the front engine room bulkhead and be replaced by new ones without reducing the strength at the points of connection.

The interior finish of the train is made of heavy aluminum sheeting on the curved roof and plymetal sheeting on the sides. The space between inner and outer cover, about 3 inches thick, is filled with a very efficient type of insulation against heat and sound.

Produces Bright Nickel Plating

BY ADDING a chemical material to any ordinary nickel electroplating solution of proper composition, the Harshaw Chemical Co., 1945 East Ninety-seventh street, Cleveland, has developed a process for producing bright nickel plating which does not require buffing and polishing before a plating of chromium can be applied.

It is said that the new process offers savings of 60 to 80 per cent in the cost of finishing chromium plated products. Another advantage is that parts not previously suitable for chromium plating, because their shape made proper polishing after nickel plating impossible, can now be chromium finished without difficulty. In some cases, it has been observed that the throwing power of chromium over the bright nickel is greater than over buffed nickel.

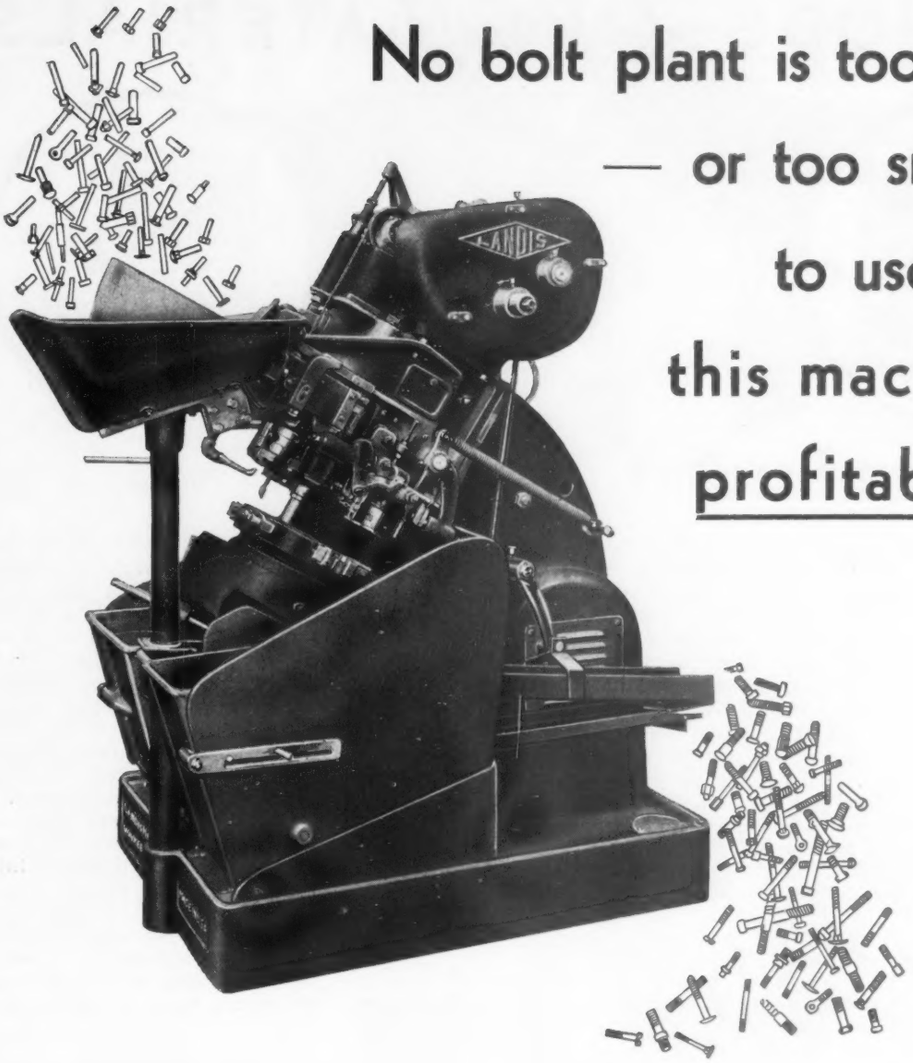
The process, developed as a result of two years experimentation, gave consistently satisfactory results in the laboratory, however, it was not known whether it would function satisfactorily in large-scale commercial units. The first commercial test was made over a year ago on a 13,000-gallon tank, and the results confirmed laboratory experience. During the last several months, three large automobile plants have been using the process and all have reported satisfactory results.

It had been known previously that bright nickel could be produced, but it had not been produced in sufficient thickness to be useful commercially. The new process is claimed to give the necessary thickness and the finish is scarcely distinguishable from finished chromium plating. The bright nickel has a very fine crystal structure and is unusually hard, thereby increasing corrosion resistance.

The chemical which is added to the nickel bath is an organic material, the nature of which is not divulged. Supplied by the Harshaw company under license arrangement, the chemical agent is added to the bath as a 1 per cent solution, therefore, its cost is comparatively low.

Engine Castings Are Thinner

Improvement in casting technique has permitted the Ford Motor Co. to decrease the thickness of the cylinder head walls and other sections of the cylinder block and crankcase castings in its V-8 engine by amounts in some instances up to 1/16-inch.



No bolt plant is too large — or too small— to use this machine profitably!

The Landis Automatic Forming and Threading Machine can be used profitably in all bolt plants, regardless of size.

In the large plant, where runs are long and production is the keynote, the efficient, high speed operation of this machine, plus the fact that the pointing and threading operations are combined, keeps a flow of work moving steadily through the threading department in a strong, rapid stream.

In the smaller plant, where production consists of short runs of standard bolts or specials of a wide variety of types and sizes, the versatility and the ease with which the Landis Automatic Forming and Threading Machine is changed from one job to another, insures profitable production because of lower costs.

Write us today for typical production figures and descriptive literature.

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METHODS AND MATERIALS

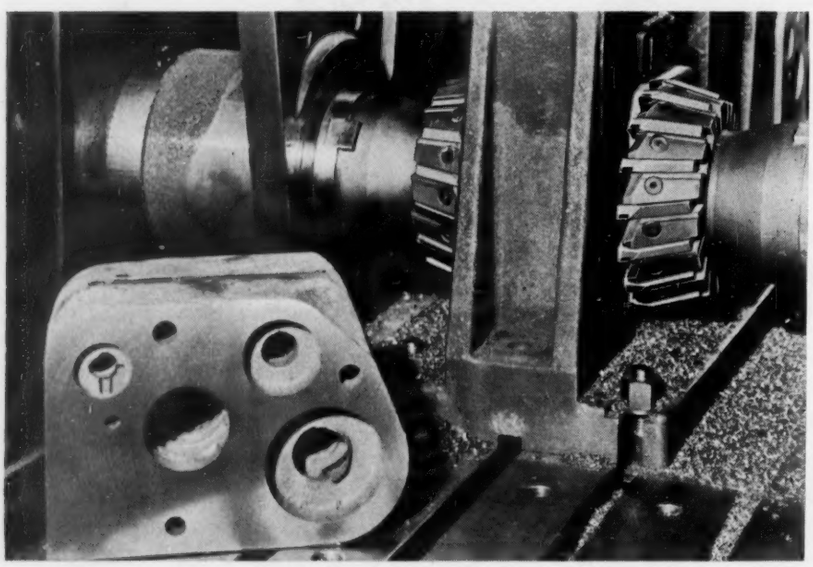
New Sludge-Free Anode Permits Superior Plating

A new anode developed by the Hanson-Van Winkle-Munning Co., Matawan, N. J., and known as Zam, from its constituent elements, zinc, aluminum and mercury, is not attacked by acid or cyanide solutions until the current is applied. This anode can be used completely in a zinc solution and no sludge, it is stated, will be found at the bottom of the tank regardless of how long the anodes are used. With no sludge formation there is no anode polarization, so that practically no increase of voltage is required at any time, either at the start or during plating. As a result the rheostat may be set at a required point with assurance that the right amount of zinc desired will be deposited in a given time.

Using the new anode, the company states, a deposit may be obtained which will withstand six Preece tests. Absence of hydrogen in the deposit due to the ability to plate at high current densities and low pressure makes it possible to obtain a ductile, adherent deposit without any danger of cracking or abnormal distortion. Cyanide zinc solutions can be obtained with a fairly constant metal content by using the new anodes; this is made possible by the use of steel containers and ball anodes. As the anodes develop no coating during plating, there is no contact resistance between the balls. The new anodes may be furnished in bars and plates if desired.

The new anodes, it is stated, can be used in cadmium solutions and will convert such solutions into zinc solutions and the plating can be carried on without interruption until the cadmium solution is completely converted to a zinc solution, after which the highest efficiency of zinc deposition from a cyanide solution can be obtained. The new anodes, it is stated, are being used successfully by prominent wire and cable manufacturers, leading automobile builders, hardware manufacturers and makers of automobile accessories.

Cutters Save on Casting Costs



LIGHT CUTS ON CASTINGS: High hardness of cemented carbide cutting tools permits their use in taking abnormally light cuts just under the scale of sand castings, thereby allowing castings to be made smaller. According to the Carboloy Co. Inc., Detroit, a well known manufacturer of air brakes adopted one 5-inch and two 7-inch carbide cutters for milling two types of cast iron valve bodies, with the setup as shown above. With the new tools, it was found that the casting size could be reduced 1/16-inch on all faces to be milled, resulting in annual saving of over $4500. Blade consumption per yearly production of parts totaled $144.30, based on an average of 3200 pieces per grind with 0.005-inch of stock removed in grinding

Wanted: Maker of Ferrodur

"Who manufactures Ferrodur castings? Wire answer," is the text of a telegram which STEEL has received from one of its readers.

\$ \$ \$

Locked Die Separated by Liquid Oxygen Shrink

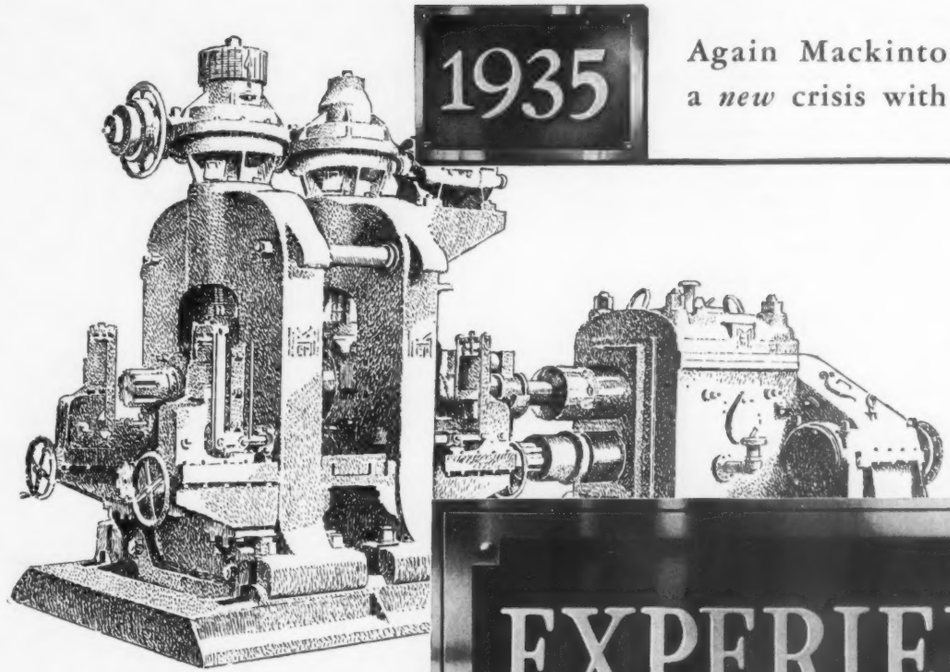
In visiting a plant manufacturing steel refrigerator cabinets a sales engineer recently helped solve a difficult problem. A careless workman had placed two steel sheets in a die designed to take one. The die locked together so tightly that it could not

1877 Steel makers needed reversing blooming mills .... Mackintosh-Hemphill built the first one

1900 The Aluminum Industry needed continuous mills .... Mackintosh-Hemphill built the first one

1904 The Brass Industry needed universal brass mills .... Mackintosh-Hemphill built the first one

1935 Again Mackintosh-Hemphill meets a *new* crisis with a *new* type of mill



EXPERIENCE FOR SALE

SINCE 1803

IN 1877 ... in 1900 ... in 1904 ... and throughout most of the rest of its career, the Mackintosh-Hemphill Company was inventing, designing and producing equipment to increase tonnage. That is what the metal industries needed.

Now, after 60 or 70 years of making bigger and faster machines to produce ever greater and greater tonnages, Mackintosh shows its complete adaptability to conditions by producing the first machine to meet the new demand for *small* orders.

It is the new reversing mill for hot rolling wide or narrow steel strip in continuous coils. With an investment of only one-sixth the capital, it produces fully one-third the tonnage of a continuous mill of 9 to 12 stands. It is economical to operate because there is no loss of time for changing gauge and width; it produces better strip because of the control of the steel temperature and because of the back and forth rolling.

One steel jobber installed one of these mills so that he could buy steel in slabs, and roll his strip when and as his customers wanted it, in any size, in any quantity, and for immediate delivery.

Another manufacturer, who has more capacity in his blooming mill than he needs for his particular product, looks upon this new strip mill as a means of producing flat material and thus opening up a new market for himself.

Every steel executive should know more about this mill. We will be glad to send you details about it.

MACKINTOSH HEMPHILL
PITTSBURGH

be separated, and the management had about concluded that its investment of approximately $3000, representing the value of the die, was a total loss. A sales engineer suggested the use of liquid oxygen and obtained some and poured it on the male section of the die. The resulting shrinkage was sufficient to permit separation.

$ $ $

Use Butt Hinges as Stops In Ingenious Bar Templets

Instead of the usual step gages, in positioning steel angles in an open throat press for shearing and for cutting miter joints, a middle western metalworking plant makes use of an ingenious bar templet. These bar templets are provided with spring actuated stops which are nothing more than ordinary butt hinges, case hardened to improve their wearing ability, and provided with spring clips which keep them in the open position. These spring clips are ribbons of ½-inch flat spring steel and are curved so as to increase their stiffness.

One end of the butt hinge is attached to the bar templet by means of countersunk machine screws; the other end, to which the spring clip is attached, is passed over the steel angle to be cut. As the end of the angle passes one of these stops, it snaps down, forming a stop against which the angle is held for the cutting operation. For backing up these stops and preventing them from weaving and loosening, steel lugs are screwed to the templet alongside the stops.

This company works largely with ¾ x ¾ x ⅛-inch and 1 x 1 x ⅛-inch steel angles, using them for the fabrication of gas range frames. The frames are assembled by arc welding, using welding assembly jigs for holding the parts. The jigs are mounted on steel plate, ⅜-inch thick, and are made by welding steel angles to the plate so as to form channels in which the assembly is clamped in the correct position for arc welding.

Wanted: Source of Supply For Generator Field Poles

"We are interested in getting a source of supply for field poles for automotive types of generators, as we are contemplating the manufacture of a replacement generator to be used on popular priced cars," writes one of STEEL'S readers. "Anything you can do to help us contact manufacturers of field poles and related equipment would be very much appreciated."

Rolled Steel Guard Rail for Bridges Is Mounted on Spring Supports

APPLICATION of highway guards on bridges has received comparatively little attention. However, in Allegheny county, Pennsylvania, recent inspection of highway bridges confirmed the suspicion that the hazard of vehicular traffic in relation to bridge members was great.

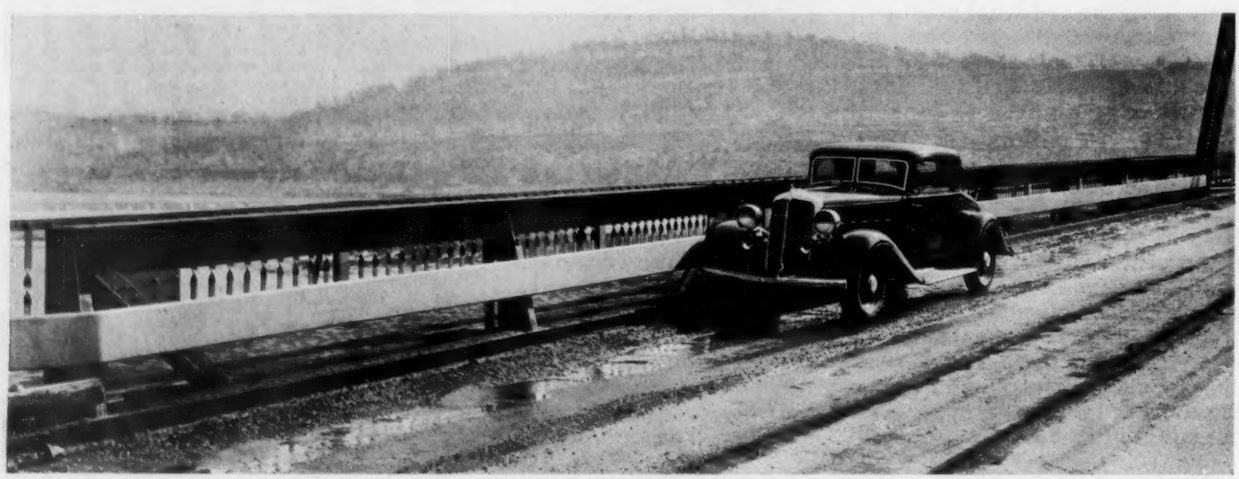
Believing that bridge members, bridge sidewalks and vehicular traffic could all be protected to greater advantage, Rex Road & Bridge Guard Co., Pittsburgh, has designed and recently announced what it terms the "Rex" road and bridge guard. Though essentially designed for bridges, its use is not necessarily so restricted.

The guard essentially comprises rolled steel channels or formed sections of variable thicknesses. Flexibility is provided by the back support which involves either one or two flat spring steel sections, the latter in turn bolted to the bridge members, as shown in the illustrations on p. 46. Recommendations favor a distance between supports of not over 20 feet. Flanged sections with rounded corners offer the least possibility of damage to vehicles and passengers. This design also has the advantage of providing for expansion and contraction as the result of temperature changes.

Shows Good Flexibility

A section of this type of bridge guard has been installed in a 110-foot length on the Highland Park bridge, Pittsburgh, as shown in an illustration. In this installation the guard was of ¼-inch plates formed into channel sections and supported on steel springs, 32 inches long and 8 inches wide, which are fastened to bridge members about 13 feet apart. The channel has a 12-inch face and is placed 24 inches above the roadway to the center of the guard. This unit is so flexible that it will respond even to pressure of the hand, but it is designed primarily to withstand the heavy impact of motor vehicles.

Fabrication of the guard rail is relatively simple. Either a rolled channel or formed plate section is used in lengths to correspond with bridge panel lengths and spliced with countersunk bolts. At the joints, bent spring steel flats are so set as to absorb collision shock with the outer guard member. The springs in turn



This 110-foot length of road guard on the Highland Park bridge, Pittsburgh, is of ¼-inch plate, formed in channel section and supported on steel springs

How well . . . how economically . . . is lubrication playing its vital part in your **METAL FORMING** *operations?*

"CAN it be drawn?" has become a universal first-question whenever a new design is being studied. The modern magic of metal forming has made things possible that were once undreamed of—particularly in the way of high speeds and low costs of production. Indispensable to automobile manufacture, and now widely accepted for the production of small containers, cooking utensils, etc., metal forming is *dependent on correct lubrication* in direct proportion to the severity of the draw.

Practically everything from soap solutions to graphite has been used in this work—experimentally. The wide variety of demands, and the peculiar functions of lubrication in metal forming, make each new operation an individual problem for the expert.

Standard Oil (Indiana) offers a complete range of correct lubricants, and competent assistance by men from your local Standard Oil office. Use them.

CORRECT LUBRICATION

STANDARD OIL COMPANY (INDIANA)

Copr. 1935, Standard Oil Co.

A PRACTICAL paper on "Metal Forming Lubricants" has been prepared by the Engineering Department of the Standard Oil Company (Indiana). Use the coupon to also obtain copies of the other helpful papers listed. Note on an attached sheet any other lubrication problems in which you are interested.

Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago, Ill. (85)

Gentlemen: Kindly send copies of the papers checked to the undersigned. It is understood that no obligation is implied.

- ☐ "Metal Forming Lubricants"
- ☐ "Lubrication in Honing and Lapping Operations"
- ☐ "Lubrication in Grinding Operations"
- ☐ "Lubrication in Gear Cutting Operations"
- ☐ "The Lubrication Engineer —His Value to You"

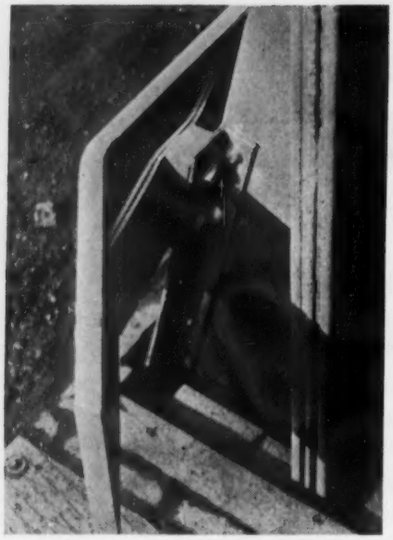
(attach list of any additional subjects in which you are specifically interested . . . .)

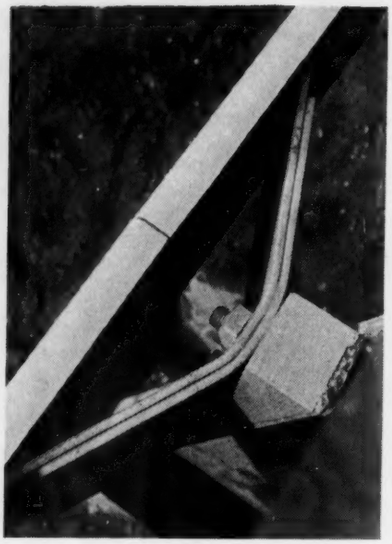
Name ..... *Position* .....

Company .....

Address .....

City ..... *State* .....





Details of how the guard rail is mounted on supporting posts. At the ends (left) and at joints (right) bent spring steel flats are set to absorb shock from the outer guard, and are in turn bolted to bridge members

are bolted to the bridge members, or, as in the case of deck bridges, the guard may be fixed to posts of malleable iron or spring steel.

Several methods of adjusting the spring steel flats have been recommended. Standard method is to form eyes on each end of the spring leaf into which round steel pins of about 1-inch diameter are fixed, extending beyond each side of the spring about 1 inch. These pins are set into slotted holes about 6 inches in length. The slots are in lugs, which are fastened, either by riveting or welding, to the guard.

This type of highway guard lends itself to easy replacement of damaged sections and is readily accessible for painting and maintenance.

Simple Description of Resistance Welding Set Forth in New Booklet

WHAT is resistance welding? It is a combination of heat and pressure used to join together two or more pieces of metal. The origin of this type of welding occurred when two pieces of steel were butted together and an electric current passed through them. At the point where the two pieces met, it was found that the steel became soft and, when pressure was applied at the ends of the steel, the two pieces fused or welded, forming a weld as good as a blacksmith weld.

"The steel heated at the ends where they touched because of the resistance to the flow of current at this point and if it were not for the increased resistance at this point, the two pieces of steel would heat evenly throughout their entire length. It is from this fact that the name resistance welding is derived."

This definition of resistance welding is quoted from the opening paragraph of a new 24-page booklet, issued by Electric Controller & Mfg. Co., Cleveland, and entitled "Uniform Welds," which, in simple, nontechnical language describes the principles and factors involved in the production of welded joints by this method. From it the man who is interested in resistance welding but is not well informed on the subject can get a clear and correct understanding of the fundamental story. It discusses the different forms of resistance welding, such as spot and projection welding, and the weldability of the various metals. It defines the terms primary circuit and secondary circuit.

Some of the causes of unsatisfactory welds are discussed. These include changes in line voltage, variation in the thickness of the metals being welded, scaly or dirty surfaces on the work and pitted and oxidized electrodes. Automatic weld timers, such as made by this company, measure a uniform number of heat units for each weld and assure the production of good welds by compensating for variables that change the rate of current flow. These timers not only assure sound welds but promote speed of production.

Information on practical spot welding of low carbon steel, including kilovolt ratings, electrode face and pressure in pounds for each gage number, is included, together with complete data on the welding points for all of the metals.

The book illustrates a number of interesting resistance welding jobs. It tells of the satisfactory welding, on one machine, of two and three thicknesses of metal and illustrates such welding on automobile body work. This operation, involving 16 welds per body, is conducted with an automatic timer and over a period of many months each weld has been perfect. "This means a large saving when it is considered that it costs $2.50 to $3 and often as high as $5 to fix up a defective job before the finish can be applied to the steel," states the book.

Electroplaters Announce Program

AN IMPOSING list of technical papers has been announced for the annual meeting of the American Electro-Platers' society which is to be held in the Stratfield hotel, Bridgeport, Conn., June 10-13. These papers will cover many phases of electroplating research and production work.

In connection with the meeting, an exhibition of materials, equipment, apparatus and machinery used in the metal finishing field, will be held in the exhibition hall of the Mosque Temple. Approximately 75 leading manufacturers and jobbers will display their products. The exhibit will remain open from the afternoon of June 10 to the evening of June 14.

Technical papers scheduled for presentation at the various sesions are as follows:

Monday, June 10

AFTERNOON

"The Manufacturer and the Plater," by A. P. Munning, Hanson-Van Winkle-Munning Co., East Mattawan, N. J.

"Report of Research Work," by Dr. William Blum, bureau of standards, Washington, and P. V. Strausser, A. E. S. research associate.

"Effect of Different Acids on Cold Rolled Steel," by E. T. Candee, chief chemist, American Metal Hose Co., Waterbury, Conn.

"Adhesion of Electrodeposits," by W. R. Meyer, research chemist, General Electric Co., Bridgeport, Conn.

Tuesday, June 11

MORNING

"Black Nickel Plating," by Joseph Downes, Remington-Rand Inc., Middletown, Conn.

"Plating Antimonial Lead," by Clarence

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Hemle and W. R. Meyer, General Electric Co., Bridgeport, Conn.

"Barrel Finishing, Plating and Burnishing," by William Delage, Oakville division, Scovill Mfg. Co., Oakville, Conn.

"Spotting Out of Plated Cast Iron," by W. W. Rowe, North & Judd Co., New Britain, Conn.

"Electroplating Zinc Base Die Castings," by Charles Costello, C. Cowles Co., New Haven, Conn.

"Coloring of Metals," by Harry MacFayden, Arrow-Hart-Hegeman Electric Co., Hartford, Conn.

EVENING

"The Mechanism of Electroplating," by Dr. Hiram Lukens, University of Pennsylvania, Philadelphia.

"Spectrograph Analysis as Applied to Electroplating," by Dr. D. T. Ewing, Michigan State college, Lansing, Mich.

"X-Ray Diffraction of Metals," by Dr. H. R. Isenburger, St. John X-Ray Laboratories, Long Island City, N. Y.

"Measuring Thickness of Electrodeposits with a Microscope," by Dr. Carl Heussner, technical director, Chrysler Corp., Detroit.

Wednesday, June 12

EVENING

"Air Conditioning of Plating, Buffing and Lacquering Rooms," by A. W. Knecht, consulting engineer, New York.

"Brightening Up the Plating Room," by J. A. Coolahan, Hercules Powder Co., Wilmington, Del.

"Why Metals Corrode," by Dr. R. A. Burns, assistant chief chemist, Bell Telephone Laboratories, New York.

"Methods for Prevention of Season Cracks of Brass in Electroplating," by B. J. McGar, assistant chief metallurgist, Chase Companies, Waterbury, Conn.

Thursday, June 13

MORNING

"Electrodeposition of Tin," by E. A. Shields, chief metallurgist, Westinghouse Electric & Mfg. Co., Springfield, Mass.

"Optimum Metal Concentration of Nickel Solutions," by Dr. D. A. Cotton, chief research engineer, Delco-Remy Corp., Anderson, Ind.

"Relative Value of Accelerated Corrosion and Outdoor Exposure Tests," by Dr. William Blum, chemist, national bureau of standards, Washington.

"Adventures in Electroplating Copper from Ammoniacal Solutions," by Dr. E. A. Vuilleumier, Dickinson college, Carlisle, Pa.

Installs Fence of 18-8 To End Salt Spray Corrosion

A leading manufacturer of steel fence has been confronted wth the problem of meeting heavy salt spray atmospheric conditions at a sea coast installation for a private concern in Texas. The life of galvanized wire fence was found to be but little more than 2 to 3 years, and copper-bearing fencing, around 4 to 5 years. To meet this problem, about 5 miles of fencing manufactured from 18-8 chrome-nickel stainless steel wire has been installed.

Actions and Reactions

IN THE WELDING FIELD

BY ROBERT E. KINKEAD

We Take Our Bow

IT IS not so important to us as it used to be whether a man is a common laborer or the president of a great corporation. If a man likes his job and is good at it, he is sane and reasonably happy. This stuff we write is dedicated to such people.

A considerable part of what we write is about welding. We have been in that field now for more than 20 years. That is our job and we would not trade jobs with any man in this world. But we also write about people and business and other things because we are interested in them.

IN THIS column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL.

The reason we write this column is that, over a period of years, people have shown a disposition to read what we write. Out of such situations have been born enduring friendships which have contributed greatly to our satisfaction with life.

Let's Pass a Law

Gentlemen in Washington are writing noble bills to take the profit out of war. That is always a good bet to get the people's minds off immediate problems, particularly those involving spending large sums of borrowed money now. It would be much more simple and understandable merely to write a law prohibiting war. Then the law could be repealed when the people change their minds and want to fight.

In a war, materials are needed in vast quantities and the need is usually desperate. Of course it ought not to be so but unfortunately it is true that the quickest way to get results is to offer high wages and profits for delivery. Even citizen Stalin finds the comrades work better on piecework rates with a cash incentive for quantity production. In this land of the free and home of the brave, arc welding operators will keep the arc going 25 per cent of the time on day work rates and 50 per cent of the time on piecework rates with a cash incentive.

Writing the rules of warfare in time of peace is a lot of fun for people who are unaccustomed to dealing with realities and it is also good politics when a number of fantastic schemes for management of the country are wilting under the impact of everyday experience.

Short Shorts

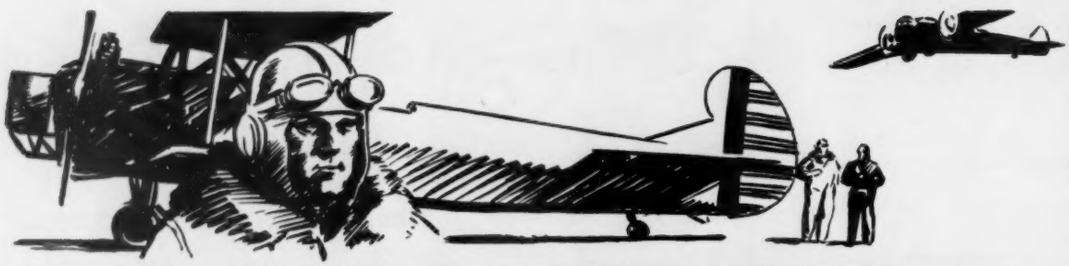
What every manufacturer wants these days is a plant so completely automatic all he has to do is drive down in the morning and push a button to start production. Then in the evening he can come and push another button at quitting time. Special automatic machinery is due for prosperity. The modern strip mill illustrates what happens in terms of orders.

* * *

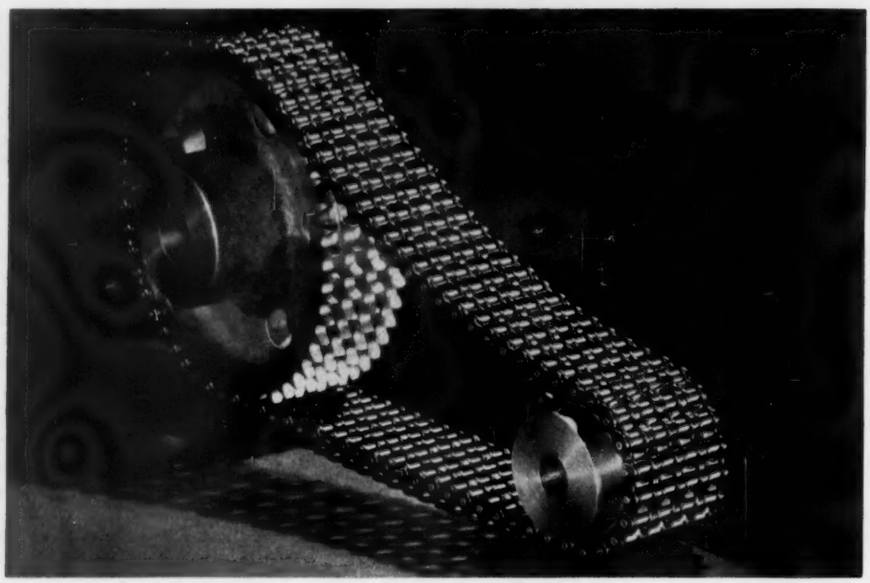
Manufacturing industry can build an airplane which can fly better than a bird, a submarine which can swim better than a fish, a weld which is stronger than the pieces joined. This is the result of scientific method. We cannot pray, wage war, or govern more effectively than our ancestors could a thousand years ago because we do not know how to apply scientific methods to these things.

* * *

A rolling mill housing may be made in the form of a welded steel assembly, but the welded construction costs more and offers no advantage which is not found in a steel casting free from defects.



IF CHAIN WERE A NEW INVENTION..



MANY NEW WAYS OF APPLYING IT WOULD BE FOUND

Rex Roller Chain Drive *is positive*—and 98% efficient—which makes it the most efficient means known of transmitting power.

It is long-lived—wear is very slow, as the smooth, exact surfaces of its rollers roll smoothly in and smoothly out of the accurately cut sprocket teeth.

It can be fully enclosed, completely lubricated in oil-tight housings where difficult operating conditions prevail.

It can be applied on extremely short centers—and maintains its absolute ratio between speed of drive and driven shafts.

There are new ways of applying Power

Rex Chain Drives today offer many new opportunities for economies and improvements in many types of drives today.

Application Engineers of the Chain Belt Company are always available to help work out your drive problems, with a complete line of standard and special Rex Roller Chains, 3/8 to 2½-inch pitch and 270 standard Rex Chabelco Steel Chains or any Special Chain your service may require.

CHAIN BELT COMPANY
1660 W. Bruce St., Milwaukee, Wis.

CHAIN BELT COMPANY

REX CHAIN AND BELT CONVEYING

Short-Cycle Malleable Iron Reduces Machining Costs

BY J. M. HIGHDUCHECK
Supervisor, Cutting Tools and Applications
Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

PERHAPS no one can appreciate more than those actively engaged in the machining industries the true significance of new developments which present opportunities for greater and more economical production. To attain high levels of production with a consistently high standard of quality, every manufacturer constantly must seek new methods and materials. Every manufacturer working on a quantity production basis appreciates the many factors restricting increasing the speed of his machine—obviously the first plan to be adopted when any effort is made to reduce the per-piece machining time of the various component parts of the finished product. When that is done, attention is usually focused on the tools doing the job or the material being cut.

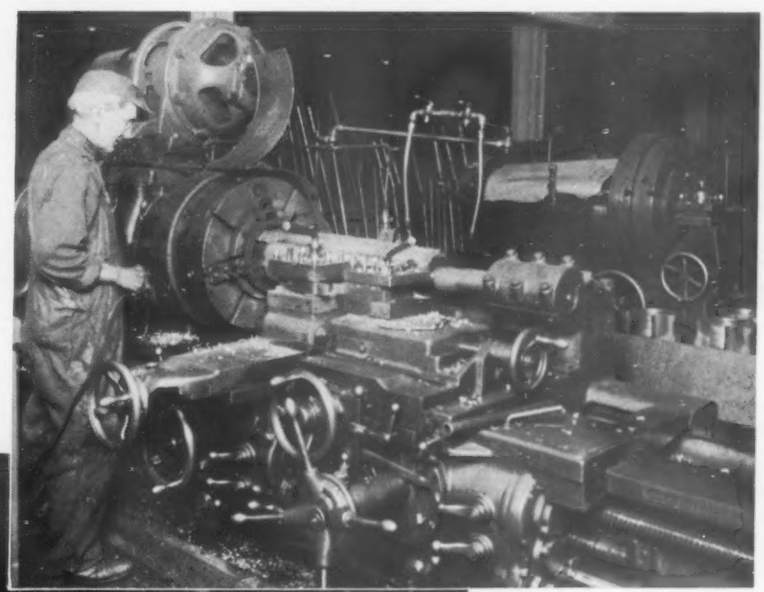
For years at the Westinghouse plant, a troublesome material, as far as machining is concerned, apparently has been malleable iron castings. Engineers, metallurgists, demonstrators, as well as those responsible for machining and production, often went into a huddle over the machinability of this material.

Better to illustrate the hardships frequently encountered in machining malleable iron castings, two cases have been selected which represent light and heavy-weight castings. Sometimes we think of this condition only in the light-weight castings, perhaps because of the thin cross sections light castings generally possess. Regardless of the weight, however, inconsistency in the machinability of malleable iron exists. Figs. 1 and 2 are representative of these conditions.

Fig. 1 shows a machining operation in which malleable iron porcelain insert is turned, faced, drilled and tapped. The weight of this casting is about 1 pound. The floor-to-floor time is 0.0176-hour each, and the departmental cost of each piece is 11.2 cents or $224 per ton.

In this case, as it happened, Westinghouse purchased castings from several suppliers. Periodically, either from one or the other supplier, an intermittent amount of hard and scaly castings would be received which could not be machined at the speeds and feeds set by the time study department. Often the operator, not knowing the inconsistency of the castings, would start machining. After machining several pieces, the cutting tools would show excessive wear which proved either lower speeds or frequent tool changes were necessary. To maintain the same tool performance, it was agreed to reduce the machining speeds. After an exhaustive time study over a period of several months and the machining of a number of tons of these castings, a machining rate was established which was 8.3 cents each or $166 a ton. In other words, a difference of $58 a ton exists between malleable iron castings properly and improperly annealed.

Fig. 2 shows a malleable iron



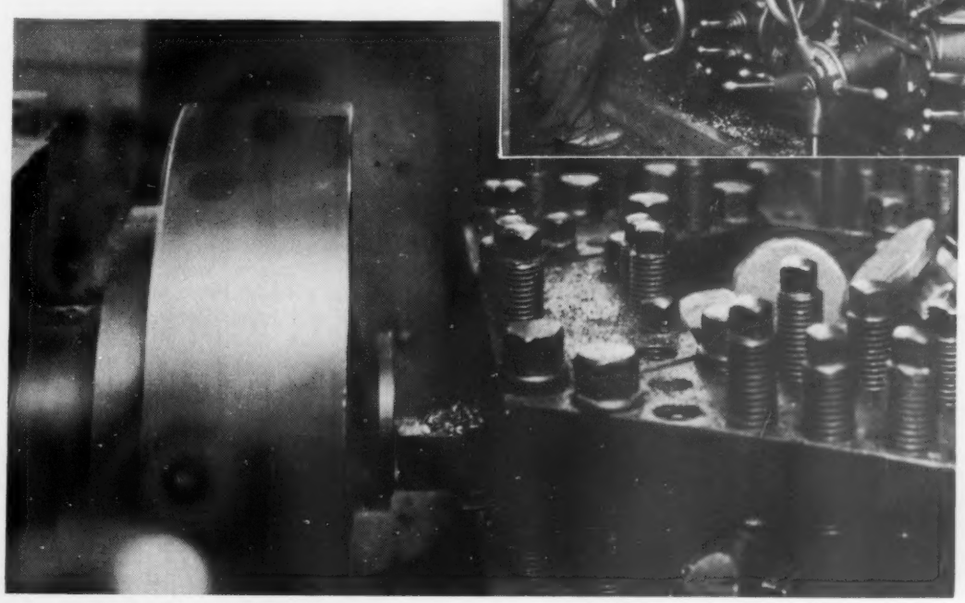


FIG. 1 (left) — Closeup view of machining operation on malleable iron porcelain inserts. Fig. 2 (above) — Machining operation on malleable iron spider shaft, which is bored for 6 inches on each end and turned the full length. Intermittent cutting is involved on the outside diameter, a true test of tool performance

spider shaft which is bored for 6 inches on each end and turned the full length. The outside diameter of the spider is convex, having six ribs equally spaced. Each rib is approximately 1½ inches wide running full length of the spider. This class of machining is known as intermittent cutting and is recognized generally by machine operators as the most difficult in machine shop practice. In this case, the tool is entering into and breaking through hard scale six times every revolution. The presence of hard spots or excessive scale on a job of this kind is costly.

Periodically, this job would come through production in lots of 25 pieces. For some reason or other, out of every 25 pieces, eight to ten were so hard and scaly that the machining speeds had to be cut 25 to 50 per cent. In practically every lot of castings, a few would have to be reannealed before they could be machined. A check regarding the economy of this job showed in every ton of castings machined a variation of $63, apparently from no other cause than inconsistency of the material.

Easier on Cutting Tools

Tests show the new short-cycle electric furnace malleablizing process produces an iron that machines more uniformly. The elastic process also eliminates pearlite surfaces and rims from castings. This perhaps results from elimination of the decarburized surface in the castings. Carbon not only acts as a lubricant to the tool, but also causes the chips in boring or turning operations to clear the cutting edge, thus preventing excessive friction and wear on the cutting edge of the tool. Decarburized iron is pure iron. It is soft, tough, and machines like rubber. For threading operations, the surface is plainly inferior.

With the development of the electric malleablizing process, Westinghouse ordered 5 tons of various weight castings and set up plans for an exhaustive test. Cutting tools used in the test were the same as those used formerly, and the object was to determine what speeds and feeds could be used economically. The machine selected for this test was a semiautomatic screw machine. The starting point was the speeds and feeds used formerly. After machining what was considered a run of castings treated by the old process, the cutting tools were inspected and pronounced satisfactory. In the re-running, speeds and feeds were increased step by step. It might be mentioned that the sequence of operation was such that no time was lost between indexing from one position to the other.

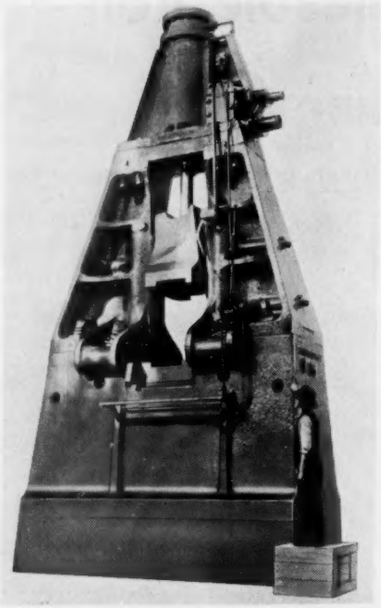
The first operation consisted of centering, drilling, facing and tapping, after which the casting was placed into the second machine which performed the next operation, the turning of the 1-inch diameter followed by threading. The allowed time per piece on castings treated by the old process was 0.0056-hour each. The saving on the first operation was $36.60 per ton. The savings as the result of increased tool life was $7 per ton, making a total of $43.60 on the first operation.

On the second operation, the allowed time per piece on castings treated by the former malleable process was 0.0088-hour each. The tool life was 1600 pieces between grinds. On castings treated by the new process, the allowed time was 0.0055-hour each, with an average tool life of 2400 pieces per grind. The saving on the second operation amounted to $52.20 per ton. The saving on tool life over the old process amounted to $6.10 per ton, making a total saving of $58.30. Adding the two savings together, the total was $101.90 per ton.

Another interesting angle regarding the machinability of malleable iron treated by the old and new process was revealed in a job which, while simple, was likewise expensive. The operation involved two castings, matched together, placed into a fixture, clamped and drilled with a 0.260-inch diameter drill at 1250 revolutions per minute, using 0.006-inch feed per revolution. The best possible drill life between grinds was 300 sets. Drills were changed four times every seven hours, resulting in a 15-minute production interruption at every change. In addition to this expense, the toolroom charged the department 60 cents a day for reconditioning the drills which made a total of $3.25 a day in keeping this job going, or a cost of $11.60 in machining one ton of these castings.

With castings produced by electric malleablizing, it was possible to machine 3200 sets between grinds, and the loss of $11.60 in machining one ton of castings was wiped out; records showed that a saving of $2.30 was made due to increased production; in other words, the total saving over the old process was $11.60 plus $2.30 or $13.90 per ton.

Hefty Hammer



INSTALLS NEW DROP HAMMERS: Here is one of four new steam drop hammers of 12,000-pound capacity built for forging Buick crankshafts by the Chambersburg Engineering Co., Chambersburg, Pa. The new hammers are unusually heavy (400,000 pounds), mass being used to help counteract shock. Ram measures 42 inches, front to back, distance between guides is 32 inches and the stroke is 51 inches. The new cylinder, of Cecolloy (a nickel-molybdenum alloy), and balanced slide valve are said to give correct speed at impact, with quick pickup after the blow and considerable saving in steam or air. Base of the frame lips the anvil to form guides on both sides of the thrust shoulder, preventing twisting

Develops Lubricant for High Rolling Loads

Wide variations in temperature, between winter and summer, in the average steel mill creates a considerable problem in lubrication.

A lubricant suitable for use in connection with pressure feed systems to roll necks must carry upward of 20,000 pounds per square inch before rupturing the oil film. It is also necessary to provide a lubricant which will not stiffen or congeal severely in the winter, as this causes irregular feed to the bearings; on the other hand the lubricant must not become too liquid and flow too readily in hot weather.

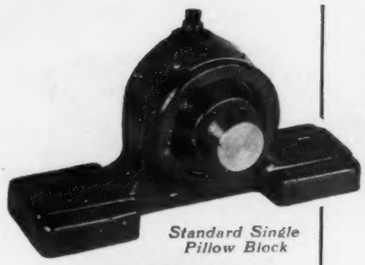
It is possible to obtain an extreme pressure lubricant wherein the high film strength properties are not obtained by added materials whose difference in gravity allows them to precipitate or settle out in use or in storage. In certain famous Swedish steel mills a lubricant having these properties and low channel point has replaced various light greases and grease-and-mutton tallow mixtures, which formerly were the standard greases used by those mills.

The new lubricant, which is known as Sta-Put No. 580 and manufactured by E. F. Houghton & Co., Philadelphia, has a melting point of 190 degrees Fahr. and a channel point of 20 degrees Fahr. It is water-resistant and meets a distinct need, due to high load carrying ability of about 25,000 pounds per square inch at working temperature. It was designed for cold roll neck lubricant and for other heavy duty jobs.

Conveying Hot Steel Sheets

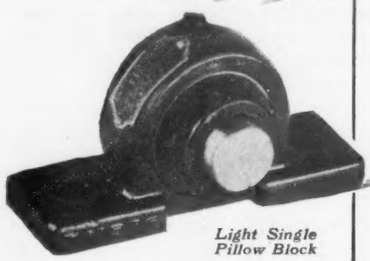
Demands

the *Right Bearing*

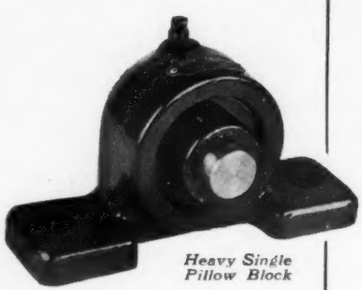


Standard Single Pillow Block

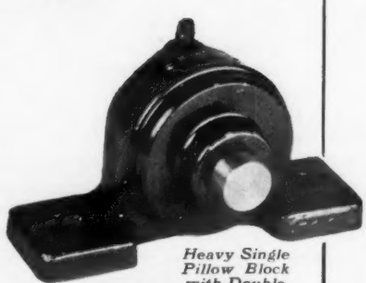
Standard Double Pillow Block with Double Seals



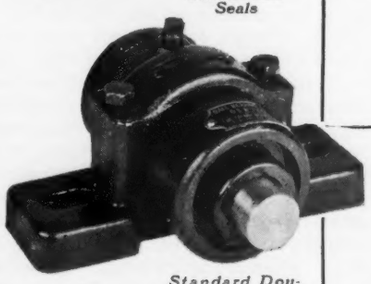
Light Single Pillow Block



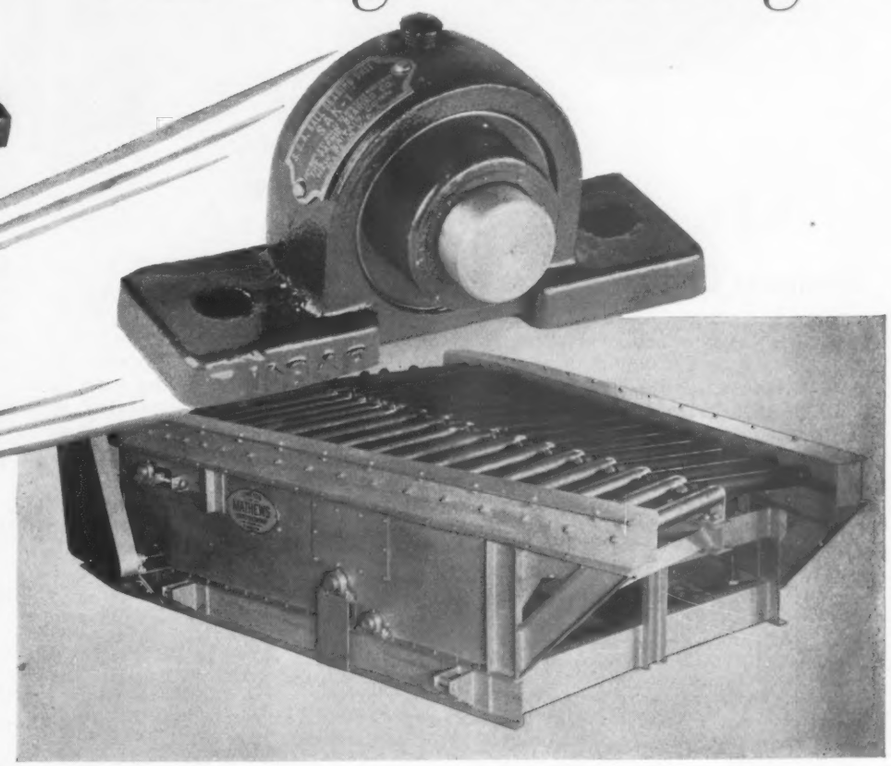
Heavy Single Pillow Block



Heavy Single Pillow Block with Double Seals



Standard Double Pillow Block



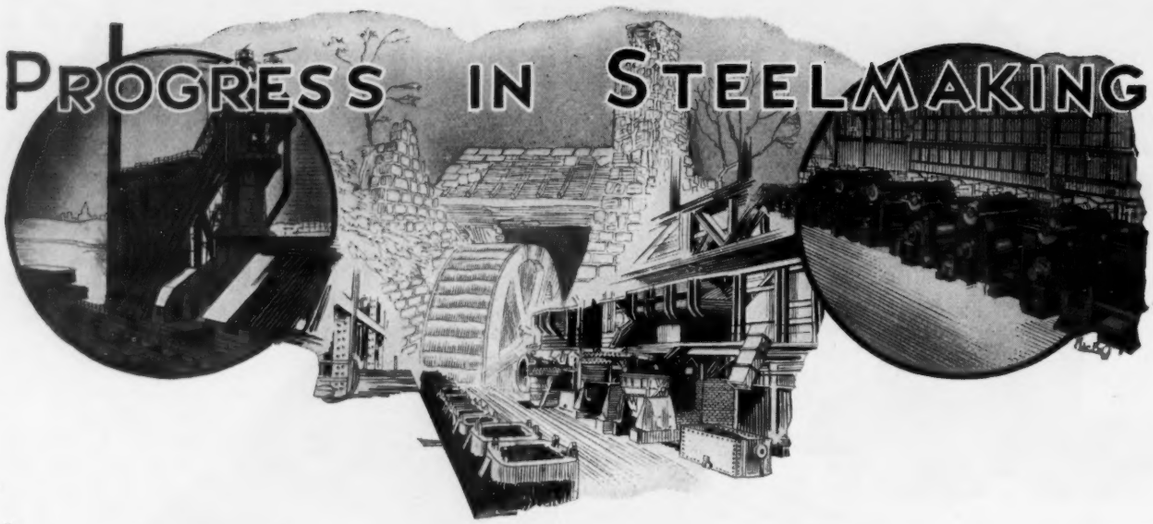
To retain heat in rolling mill sheets in progress from furnace to mill, it is necessary that the material be handled as speedily as possible. This run-out conveyer uses Fafnir Ball Bearing Pillow Blocks at several important points to reduce friction to the irreducible minimum, making this speed possible.

The chain-driven herringbone rollers in the feeder table, part of the process involving the use of continuous furnaces, conveyers and mechanical handling apparatus, are Fafnir-equipped. The drive likewise is mounted on Fafnir Pillow Blocks.

The use of the right Fafnir in the right place not only saves the user in cost of maintenance, but also allows full utilization of the productive capacity of the plant. There is always one bearing from "the most complete line of ball bearings in America" that can most economically transmit power. Fafnir engineers will help you to select this *right* type. THE FAFNIR BEARING COMPANY, *New Britain, Conn.* . . . Atlanta . . . Chicago . . . Cleveland . . . Dallas . . . Detroit . . . Milwaukee . . . Minneapolis . . . New York . . . Philadelphia.

WORTHWHILE *economies in design and production are given in every issue of Fafnir's house organ,* "THE DRAGON". *We will gladly add your name to the mailing list.*

FAFNIR
BALL BEARINGS



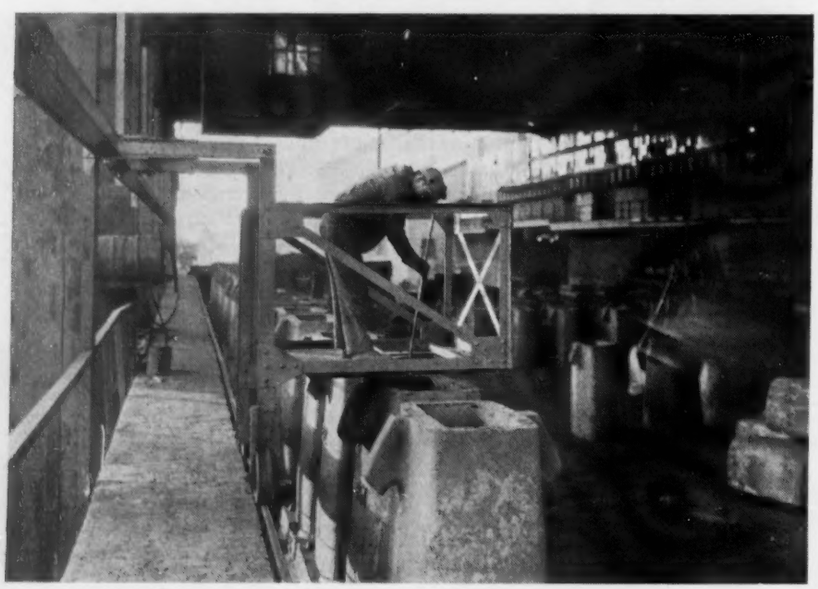
Eliminates Excessive Wear

A new method for mounting trolley rails on the bridge girders of overhead cranes is being tried at a steel plant in Pennsylvania. Flat steel strips ⅜-inch thick, 8 inches wide and of such length as to clear the rivet heads are welded to the top plate which support the rails. The latter are held securely by standard clips welded to the top plates. Longitudinal movement of the rails along the girder is prevented by a plate welded to the top plate at each end of the girder. The rails usually are held in place by bolting the clips to the girder. On cranes operated in the open this conventional method of mounting the rails usually results in a rapid wearing away of the top plate on account of the abrasive action of sand and water which accumulates between the top plate and the base of the rail. Under the new method of mounting, however, excessive wear is eliminated.

◆ ◆ ◆

Device Removes Serious Safety Hazard

MOVABLE PLATFORM SPEEDS CLEANING OPERATION—Mold cleaning practice and its effect on the quality of ingots and life of molds is being studied more closely by steelmakers. Where members of the mold yard gang are required to stand on top of the mold in performing their duties, the degree to which the interior walls of the mold are cleaned depends largely upon the temperature of the drag. Moreover, the workmen are exposed to a serious safety hazard. A movable platform, such as shown below, operating over a train of molds at the American Rolling Mill Co.'s mold yard at Middletown, O., affords a safe and effective means of scraping slag, oxides and other foreign matter from the mold surface. Because of the lower temperature to which the cleaning crew is subjected in performing the cleaning operation there is less fatigue and, hence, a fewer number of men are required. After cleaning the mold is hoisted to permit the stool to be scraped and cleaned with compressed air



New Device Sounds Alarm

A Pittsburgh concern recently announced the development of a carbon monoxide alarm which gives prompt warning by ringing an electric gong when the amount of carbon monoxide in the air reaches a dangerous point. Claim is made that this product is the only device of its type on the market.

◆ ◆ ◆

Extends Operating Life

Rebuilding sleeve gears for driving edging rolls with hard-facing alloy has been found to be particularly economical by a Pennsylvania steel company.

◆ ◆ ◆

Handles Low-Grade Ores

A magnetic separator of low energy requirements, which causes individual magnetized particles to jump away from waste matter and produce a superior concentrate, has been developed. Commercial magnetic separators at present employ direct current to produce magnetic fields of sufficient strength and concentration either to pick up or deflect those particles of an adequate magnetic susceptibility. The new separator uses alternating current of the ordinary frequencies to produce a relatively low field strength and effects rapid separation of the magnified particles. The results indicate that alternating-current operation has distinct possibilities for the fu-

ADVERTISING PAGES REMOVED

ture enrichment of low-grade ores and the purification of high-grade products.

♦ ♦ ♦

Plates Made Nonskidding

Roughened nonslip surfaces can be created quickly and at low cost on flat steel plates for truckways, door sills and loading dock toeboards at steel plants by the use of the oxy-acetylene blowpipe flame. The latter is held in one spot until the steel just begins to melt and then is withdrawn quickly. The pit marks are spread about 1 inch apart in both directions either in straight rows or alternate rows. The small indentations with the rough hard edges of the artificial pit marks constitute a long wearing roughness of the desired amount to prevent slipping even when a heavily loaded truck is being pushed.

♦ ♦ ♦

Installs Large Annealers

Coiled strip steel made by a Detroit mill will be annealed in a cylindrical bell-type furnace which when completed, will be the largest unit of this type operated in this country. The furnace will have electrical rating of 240 kilowatts. The unit is designed to take coils with a maximum outside diameter of 52 inches in stacks 96 inches high, giving it a capacity of approximately 16 tons per charge.

♦ ♦ ♦

Improves Safety Goggles

A maker of safety glasses for use in steel mills has recently adopted a composition made of paper, ground linen, bakelite and Japanese silk, for use as the glasses' eye cups. Previously aluminum cups had been used but it was found that a combination of the new materials was especially resistant to dents caused from flying objects.

♦ ♦ ♦

Markets Patching Cement

Three types of patching cements for boiler settings, open-hearth furnaces and electric melting furnaces recently have been placed on the market. Steelmakers are finding the use of these cements more economical and practical than to reline the furnace every time the walls begin to spall down.

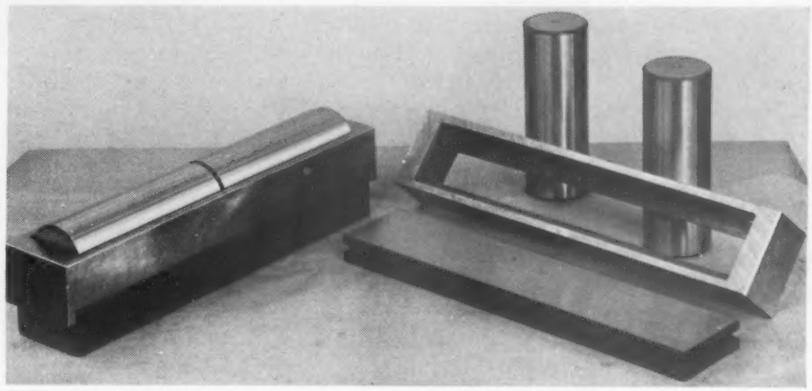


Fig. 1—Major parts of the aligner are shown at the right and an assembled unit at the left

Roller Aligner Affords Increased Life Of Heavy-Duty Mill Bearings

USE of smaller bearings for steel mill roll neck service with a corresponding decrease in the size and cost of surrounding parts is made possible by the development of a roller aligner designed by the Bantam Ball Bearing Co., South Bend, Ind. The aligner, shown in Fig. 1, was designed to overcome the short life of antifriction bearings on heavy machinery such as steel and paper mills.

The limiting factor in roll neck bearing life and the major cause of bearing failure is the poor distribution of load over the length of the bearing when roll necks deflect. Roll neck deflection causes concentration of the load on a small portion of the bearing. As a result of failure to compensate for this condition, it has been necessary continually to increase the size of roll neck bearings.

In the ordinary bearing mounting, as shown in Fig. 2, there is no method provided whereby the bearing can align itself to accommodate the deflection of the roll and therefore, the load is carried on the corner of the rollers nearest the roll body. Fig. 3 depicts how the roller aligner allows the chock to rock and relieves the load in the corners of the rollers by carrying the load over the entire length of the bearing.

The aligner consists of three major parts. A hardened steel plate which is fastened in a groove in the chock by a small clamp. A similar plate rests on the bottom of the housing window. Between these plates is a roller divided into convenient lengths, which is held in a cast bronze cage. The cage and roller assembly is located by springs which hold them central while rolls are being changed. The spring mounting permits the roller to move a sufficient distance in either direction. This construction allows the chuck to tilt angularly and to distribute load over the bearing.

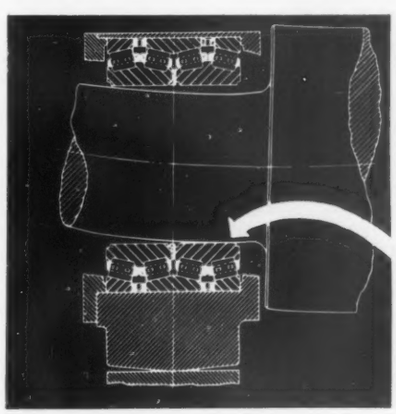


Fig. 2—Ordinary bearing mounting showing how bearing is thrown out of alignment when roll is deflected

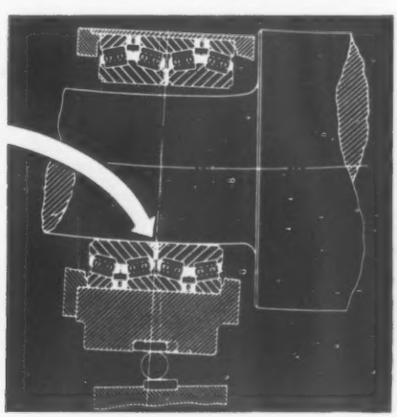


Fig. 3—View showing how roller aligner permits the load to be distributed over entire length of bearing

Will Steel Houses Furnish Sufficient Tonnage To Engage Broad Strip Mills?

WITH all the skilled art, high quality product, and apparent ease of operation, one of the most important problems confronting the steel industry in view of the large number of broad strip mills producing the same class of product and the immense tonnage output, is: What radical developments other than the automotive industry will come about in the next few years that will enable the absorption of this large production of wide strip? Moreover, at what rate will these broad mills operate in the near future, particularly when such type of mills appear to be springing up like mushrooms?

These are the important questions facing the flat rolled steel industry today, stated J. H. Van Campen, special engineer, Republic Steel Corp., Youngstown, O. at the combustion engineering division of the Association of Iron and Steel Electrical Engineers at the Spring engineering conference held at the Ohio hotel, Youngstown, O., April 25. A report of the first session held during the evening of April 24 and dealing with maintenance of roll neck bearings was presented in the April 29 issue of STEEL.

Operations Are Explained

Mr. Van Campen gave a description of a broad strip mill and explained the operations in detail. In the course of his remarks, the speaker mentioned that there are approximately 150 grades of hard surface strip demanded by the trade at the present time. In the cold finishing end, he stated, there is more unpublished data than published and he suggested that operators adopt a more lenient policy in this connection.

The magnitude, tonnage and investment of present day wide strip mills is appalling, Mr. Van Campen asserted. With a total of 18 wide strip mills already built and the possibility of two more being authorized before the end of 1935, the 20 mills will have a potential annual capacity of about 9,000,000 gross tons, he asserted. Including the necessary auxiliary equipment these mills represent an investment to steel companies of approximately $250,000,000 to $275,000,000.

What is to become of the conventional type 2-high and 3-high sheet mills numbering 600 to 700 with a capacity of 5,500,000 tons per year, he asked.

Cites New Outlet

An important development cited by Mr. Van Campen is the amount of hot rolled strip going into the production of tin plate. He pointed out that hot rolled strip in coil form going into tin plate amounts to 15,000,000 base boxes or 750,000 tons annually. This tonnage, the speaker mentioned, is equivalent to about 30 per cent of the total tin plate capacity of the United States. The aggregate flat rolled potential capacity of this country including tin plate, sheets and strip steel is about 17,000,000 tons, he said.

According to statistics and records the total production in this country of all tin plate, sheets and strip steel for 1929, the best year, is about 8,500,000 tons.

In the face of this 8,500,000 tons of flat rolled material produced in 1929 on various type hand and continuous mills compared with the 9,000,000 tons available from existing broad hot strip mills in 1934 and with more tonnage to come when additional mills are completed, the speaker raised the question as to what percentage these broad strip mills would be able to operate in the future. And yet, he said, many companies are compelled to build broad strip mills in order to protect their existing investment and to keep pace with competitive companies.

In analyzing the market for new applications of steel, the speaker cited the only visible outlet on the horizon at the moment as that of the steel house. Whether or not considerable tonnage for this particular source will develop within the next five or ten years is problematic.

Discusses Changes in Design

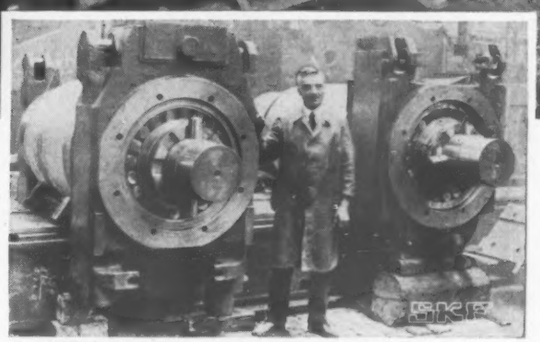
Stephan Badlam, consulting engineer, Pittsburgh, in discussing some of the changes which experience has dictated in the design and operation of broad strip mills, pointed out that in the construction of early mills four companies hazarded $20,000,000 in the construction. Mills and product at that time, he explained, were a radical different departure from conventional practice. Since then there has been an increase in the width and width to gage, an increase in the number and speed of finishing stands, an increase in the space between roughing stands, an increase in the weight of coils and an improvement in the quality of product. The dominating problem in the construction of these mills at the present time centers around the backup roll bearings. Nonmetallic bearings, he stated, are used in a few stands with satisfactory results. In conclusion Mr. Badlam mentioned that from $12,000,000 to $17,000,000 is the blue chip ante required to enter the broad strip mill game at the present time.

Practically all power supplies for continuous rolling mills consist of motor generator sets, stated C. Lynn, design engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., in discussing the "Selection of Electrical Equipment for Direct Current Power Supply in Rolling Mills." Synchronous motors are preferred for driving the generators as they are cheaper, more efficient, and provide power factor control. Within ordinary limits they are unaffected by voltage variations. Larger capacity sets are usually of the three unit type, two duplicate generators being driven by one large alternating current motor. This permits higher operating speeds for a given output, with a corresponding reduction in space required and cost.

Experience over a considerable period of time indicates that the best overall operation results when the voltage of the generators is controlled by a voltage regulator. These generators may be either straight shunt or slightly differentially compound, separately excited in either case. The use of a slight differential series field, he pointed out, produces better inherent division of load between the several generators in parallel, as well as eliminating the detrimental effect of heavy circulat-

"It's a TOUGH JOB on bearings...better use SKF's"

3360



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ing currents at the minimum voltage.

Since practically all continuous mills are started from rest by bringing the generator voltage up from residual to rated voltage, the use of shunt or differentially compound wound generators permits all generators to be operated in parallel as a unit over this voltage range.

These generators are normally separately excited and can all be excited from one common exciter. The voltage regulator can, therefore, be applied to the fields of this one exciter. All generators will thus respond alike and maintain a practically constant voltage at whatever value desired.

Modern motor generator sets are made of fabricated steel construction. The use of rolled steel provides a more substantial construction with better magnetic characteristics. Compensating or pole face windings are used as they impose less duty on the voltage regulator and give superior commutation at high overload swings. Modern brush rigging with double brush holders and the developments made in commutator construction in the past few years assure improved commutation and uninterrupted service.

Synchronous converters, Mr. Lynn stated in conclusion, are not satisfactory for continuous mill power supply since they cannot operate over the voltage range required nor do they give a sufficiently constant voltage regulation. They are, therefore, never used for such service.

H. A. Winne, industrial engineering department, General Electric Co., Schenectady, N. Y., in discussing the desirability of synchronous motors mentioned by Mr. Lynn, stressed the importance of the power factor correction. He suggested a careful study of the power factor before purchasing synchronous equipment. In the more recent mills a unity power factor is used he stated.

Recommends Constant Voltage

The inertia of unit driving the separate stands of the new broad strip mills differs and there is a tendency to throw a loop if the voltage is changed, stated George Stoltz, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. The speaker recommended constant voltage in this connection.

F. W. Cramer, superintendent of electrical construction, Republic Steel Corp., Youngstown, O. suggested that the minimum shunt field on synchronous motors should be marked or indicated on the name plate.

Walter de Fries, combustion engineer, McKeesport, Pa., in speaking on "Metallurgical and Thermodynamic Calculations as applied to Heating Furnaces", outlined a procedure for theoretical determination of all factors entering into the design of heating furnaces, expected to handle a definite tonnage in a given time and to a fixed temperature throughout.

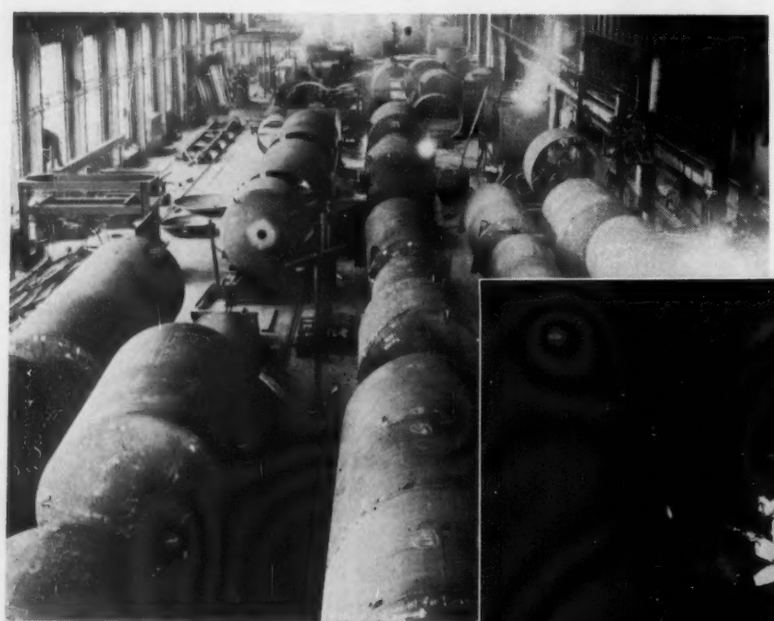
In the absence of G. R. McDermott, vice president, Surface Combustion Co., Toledo, O., his paper on "Soaking Pits" was presented by E. G. Mantle, Pittsburgh. In describing the one-way-fired pit, the speaker pointed out that the firing ports are located in one of the end walls and the products of combustion or flame is developed in a combustion space immediately above the ingots to be heated. The ingots usually are arranged in two rows along the longitudinal axis of the pit, usually from two to four ingots per row, depending on the size of ingots charged.

The hot products of combustion are delivered in part to the far wall of the pit where they turn downward between the ingots, reverse their direction and leave the pit through suitable waste gas outlets to the recuperator. Such a design permits the selection of a firing port suitable for the particular fuel to be used, thereby providing for maximum combustion efficiency.

The intensity of draft imposed on each hole of the battery, the speaker stated, is controlled by a suitable damper installed immediately after each recuperator of each hole of the battery. The operator thereby may

Glass-Lined Tanks Strong and Sanitary

TANK shop of the A. O. Smith Corp., Milwaukee, is reported to be booked months ahead in turning out one-piece glass-lined steel tanks for breweries. In 1928 Smith engineers perfected a system for glass coating steel pipelines to prevent corrosion; later this idea was adapted to tanks. The latter are of welded steel construction, with no joints or flanges. Sizes up to 40 feet in length and 12 feet in diameter have been produced.



ABOVE is a general view of the tank shop, showing tanks in various stages of construction. At the right is an unusual illustration showing three inspectors examining the glass-lined interior of one of the large tanks. The glass lining is said to be so tough that it can be hammered upon with hardwood clubs without damage.

regulate the rate of firing and also the distribution of products of combustion by the amount of draft imposed on the hole, i. e. the products of combustion assume a horizontal horseshoe path and the length of the horseshoe is controlled by the draft imposed.

We have been giving considerable thought recently to automatic temperature control of ingot heating. It is true that pit operators from experience become quite proficient in their judgment of the proper ingot temperature for rolling. However, considering the narrow range of heating temperature requirements for different chemical analysis it would seem that reliance to the heater's eye without the constant use of pyrometric control has some hazards.

We are at present constructing two batteries of soaking pits at the Campbell works of the Youngstown Sheet & Tube Co. and in connection with one of the holes we have installed pyrometric equipment for automatically controlling the firing of the hole.

In the absence of C. A. Kral, assistant general manager, Wheeling Steel Corp., Steubenville, O. his paper on "Modern Rolling of Broad Hot Strip" was abstracted by J. Farrington, electrical superintendent, at the company's Steubenville division. The speaker stated proper soaking pit practice is imperative to good quality. The ingots may be injured by over-heating, under-heating, uneven heating or worse than all, burning.

Importance of Slab Heating

Too much stress cannot be placed on proper slab heating. The requirements here are uniform heating and a scale that is readily removed. The hazards of nonuniform heating are distorted and scabby surface, roll spoilage, camber, off gage, cobbles and poor grain structure.

In obtaining the required surface, gage and drawing qualities on the strip mill, many factors contribute to successful performance — among these factors are the quality of rolls and their temperatures both in roughing and finishing train, drafts, amount of hydraulic pressure and water applied per square inch of strip area, speeds on roughing and finishing stands, the thickness and temperature of strip at point of removing secondary scale, finishing temperature, distance of coilers from mill, temperature of coiling or piling.

Following the presentation of Mr. Kral's paper C. L. McGranahan, superintendent 76-inch hot strip mill, Inland Steel Co., Indiana Harbor, Ind. described the layout of a broad strip unit for rolling both the hot and cold product. Replying to a question asked from the floor as to the necessity for running strip tight through the finishing stands, the speaker pointed out that on close coupled mills the usual practice is to maintain tension between stands No. 9 and 10. When rolling strip 0.093-inch tension is applied between stands Nos. 8 and 9 and Nos. 9 and 10. When the mills are scheduled on 16 gage tension is maintained between stands Nos. 7 and 8, and 9 and 10 in order to maintain a straight delivery of the strip.

In presenting a brief outline of the early history of the open-hearth furnace, R. S. Bower, open-hearth superintendent, Corrigan-McKinney Steel Co., Cleveland, pointed out that up to 1895 charging of all materials was done by hand. The principle of burning oxygen, he stated, has been known since 1886 but it is only within the past few years that it has been used at open-hearth shops.

By installing a steam line on the checkers, a superheat of 500 degrees may be obtained for atomizing tar at the burner, according to Mr. Bowers.

Melting Costs Are Reduced

McLaughlin, fuel engineer, Carnegie Steel Co., Duquesne, Pa. mentioned that there has been a reduction in open-hearth melting costs during the past five years of 10 to 40 per cent. The increased production per operating hour during the same period was placed by the speaker as 15 per cent. He emphasized that instruments and other tools must be given the first helper to enable him to know what is going on in the furnace. The speaker cited draft control instruments as having contributed to lower cost of operation.

Charging facilities have not kept pace with the construction of larger open hearths, stated F. C. Schwartz, open-hearth superintendent, Carnegie Steel Co., Youngstown, O. The average size charging box used for 150-ton furnaces is less than 25 cubic feet capacity. They could be made twice as large for the average open hearth, he contended, in order to afford faster charging. The speaker mentioned that one plant is experimenting with boxes of 53 cubic feet capacity and tests running over a year indicate that the practice seems feasible. He was of the opinion that a 100-ton open hearth should be charged in 15 minutes.

K. Emmerling, assistant general superintendent, East Ohio Gas Co., Cleveland, in speaking on "Natural Gas in Steel Plants" mentioned that at least 10 plants in this country are using this type gas in their open-hearth shop.

Plants which are operating most successfully on natural gas limit the rate at which the fuel is burned for the reason that after a certain rate the increase has no effect on the rate of melting.

In firing open hearths, the speaker stated, the successful way is to introduce the gas from both sides of the port. The speaker recommended the use of a high-velocity, clear flame combustion for melting and a low-velocity luminous flame for refining.

For continuous heating furnaces the luminous flame burner is useful, he contended because the steel heats further back in the furnace. The size of burners is kept small in order to balance the temperature from one side of the furnace to the other, particularly in slab furnaces. The air for combustion should be under control and should be conveyed to the furnace under 3 to 5 inches pressure regardless of whether it is hot or cold.

Automatic control is of great advantage. The speaker cited one case where natural gas at 30 cents per 1000 cubic feet was substituted for producer gas and saved 33 1/3 per cent of the actual fuel costs. He attributed this saving partly to natural gas and partly to the control system.

A decided change is under way in sheet mill annealing and the speaker predicted that in the near future the sheet and strip annealing room will be as clean as the cold rolling and shipping departments. Annealing will require less time, the cost will be down and handling of the product will be accompliished in a straight line.

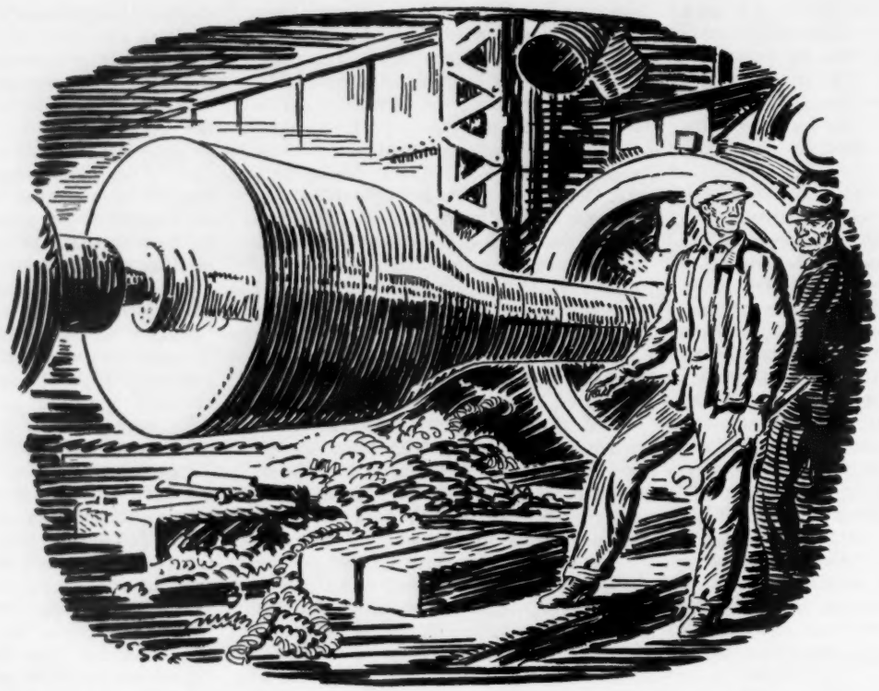
Prepared atmospheres for bright annealing, deoxidizing, and the prevention of decarburization are made most easily from natural gas, and are coming into common use, particularly in sheet and strip annealing the speaker stated. One steel company has reduced its cost of gas for deoxidizing to about 2 cents a ton.

Porcelain Enamel Institute Arranging Its Meeting

In connection with its annual meeting to be held in the Statler hotel, Cleveland, May 22, the Porcelain Enamel institute will present a typical store demonstration exhibit. This exhibit will consist of a portable furnace placed before an array of such porcelain enameled products as an electric refrigerator, gas stove, electric range, clothes and dish washers, steel tile, kitchenware, and commercial signs, all flood lighted with lamps equipped with porcelain enameled reflectors. The furnace will be in operation.

The program for the meeting will include reports of officers and committees, technical papers and discussions on the institute's market and technical research and advertising and sales promotion campaign.

Kurt R. Groener, 612 North Michigan avenue, Chicago, is executive secretary of the institute.



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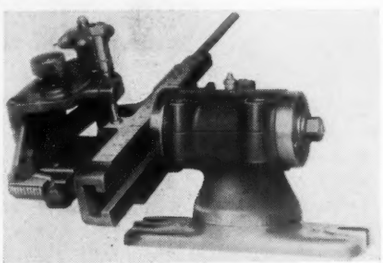
NEW EQUIPMENT

Tap Chaser Throat Grinding Attachment—

Landis Machine Co., Waynesboro, Pa., has placed on the market a tap chaser throat grinding attachment for customer's use in regrinding the throat or chamfer on its collapsible tap chasers. Base of the device, shown herewith, is arranged for bolting to the table of most standard makes of tool and cutter grinding machines. Attached to the base is a swivel base which carries the spindle to which is attached the vise base for holding the chasers. The vise base is graduated for diameters from 1 to 13½ inches. It is also fitted with a micrometer for obtaining the desired amount of radial clearance with which the chasers should be ground.



New Landis tap chaser throat grinding attachment

The vise base is provided with a milled flat which will accomodate all sizes of tap chasers manufactured by the Landis company. Individual chasers are held by an adjustable clamp and locked with a hand screw. Vise base rotates with the spindle, which is fitted in a capped bearing, to provide an oscillating movement for grinding the chaser against the face of a cup shaped wheel. To facilitate this movement a handle is fitted to the vise base. This motion will produce a radial clearance on the chaser throat.

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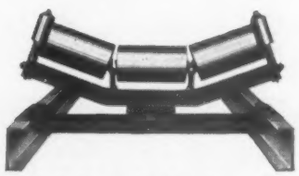
Self-Aligning Belt Idler—

Link-Belt Co., Chicago, has brought out an improved type of self-aligning idler for troughed conveyor belts. The unit, shown herewith, is made up of standard belt carrying rolls installed in a supporting frame provided with arms on which actuating rolls are mounted for the purpose of swiveling the idler frame promptly when a crooked running belt crowds sidewise enough to engage either of them. This troughing idler frame is supported by an antifriction pivotal bearing, carried on a cross member or subframe bolted to the conveyor stringers.



Link-Belt self-aligning idler for troughed conveyor belts

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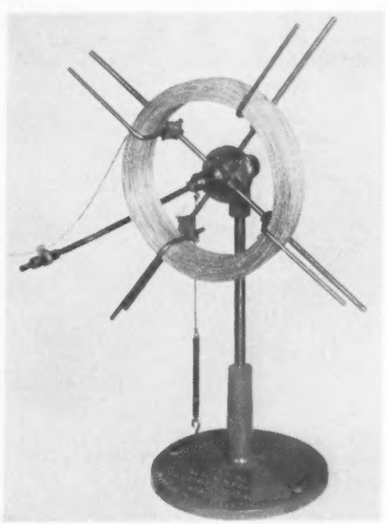
Reel with Automatic Brake—

F. J. Littell Machine Co., 4127 Ravenswood avenue, Chicago, recently placed on the market a new No. 0 reel with an automatic brake, designed to hold coils of stock weighing up to 100 pounds. This unit, shown herewith, is mounted on needle bearings. The automatic brake prevents the stock from unwinding too rapidly. When the stock is pulled forward the roller raises, releasing the brake so that stock can be drawn without any resistance from the reel. As soon as sufficient stock has been unwound the spring pulls down the roller and throws in the brake. When fitted up with arms, the reel will handle coils 9 inches inside diameter, 32 inches outside diameter, and 3½ inches wide. When fitted with plates this reel will handle coils 1¾ inches inside diameter, 32 inches outside diameter, and 3½ inches wide.



No. 0 reel with automatic brake marketed by F. J. Littell Machine Co.

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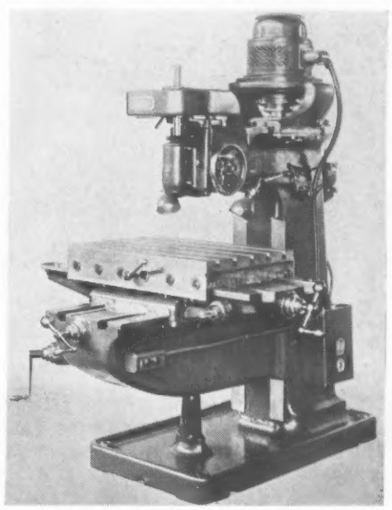
Vertical Milling and Die Sinking Machine—

Reed-Prentice Corp., Worcester, Mass., has introduced a vertical milling and die sinking machine designed for rubber mold and metal pattern work. The unit, shown herewith, is equipped for hand longitudinal and cross feeds. Table and saddle are mounted on roller bearings carried in eccentric holders for proper adjustment and operating on hardened steel ways of knee and saddle dowelled in place. Lubrication of rollers is by Alemite system. Special square nut on spindle provides for locking spindle when removing collets and cutters.



Reed-Prentice vertical milling and die sinking machine

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Industrial Tractor—

Mercury Mfg. Co., 4118 South Halsted street, Chicago, recently

brought out a new type D gas tractor equipped with large size pneumatic tires front and rear. The unit, shown in the accompanying illustration, provides a powerful industrial hauling unit of extremely compact overall dimensions and short turning radius. Overall length is 86 inches, width 60 inches, and outside turning radius 115 inches. Shock absorbing effect of dual pneumatic rear tires and large front tires provides

Mercury type D gas tractor equipped with pneumatic tires

complete cushioning of the tractor mechanism and easy riding performance when operating over rough roadways and for yard service.

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Combination Cutoff Machine And Grinder—

Cincinati Electrical Tool Co., Cincinnati, has added to its line a combination cutoff machine and grinder. The unit carries a 10 by 1/16-inch abrasive cutoff wheel on the right-hand side, operating at a peripheral speed of approximately 9000 surface feet per minute. The material to be cut is fed into the wheel by means of a handscrew. Stock is held firmly on both sides of the cut preventing wheel breakage and a fully enclosed wheel guard affords perfect protection to the operator. The vise or holding fixture may be tilted to give any angle desired up to fifteen degrees.

The left-hand side of the machine is equipped with an 8 by 1-inch grinding wheel with fully enclosed safety wheel guard adjustable to the wear of the wheel and with exhaust connection. An adjustable tool rest is mounted on the wheel guard. A two pole starting switch is entirely enclosed in the base of the one horsepower motor. The machine may be had in either floor type as shown in the illustration, or bench type if preferred.

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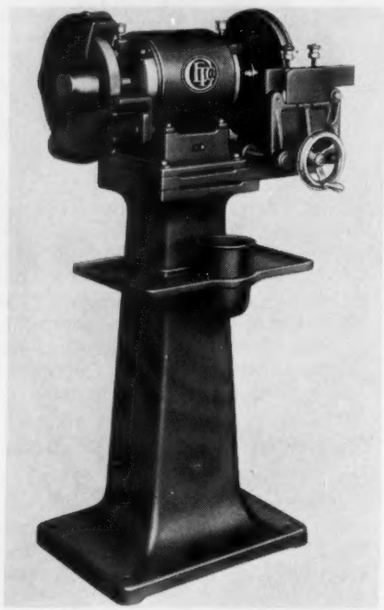
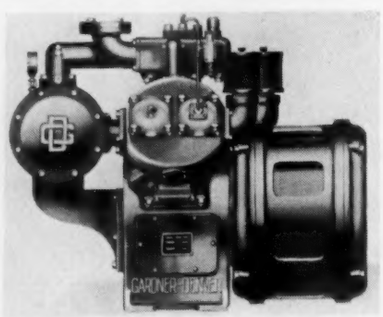
Air Compressors—

Gardner-Denver Co., Quincy, Ill., has announced a new line of three-



Cutoff machine and grinder introduced by Cincinnati Electrical Tool Co.

cylinder air compressors available in sizes ranging from 113 to 194 cubic feet per minute displacements. One of the features of these units, shown below, is the use of two small low pressure cylinders instead of one large one, resulting in lower air



Three-cylinder air compressor developed by Gardner-Denver Co.

temperature with corresponding saving in horsepower. Cylinder walls are water-cooled to provide lower wall temperature. Valves are of the "cushioned" noiseless automotive plate type, the cushioning being accomplished by the use of an air cushion pocket in the guard or bumper over each valve.

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Recorders—

Hays Corp., Michigan City, Ind., announces a new line of draft, pressure and differential recorders for ranges between 0.1-inch and 100 inches water, total scale. The new instruments are designed for sensitive control of industrial furnace pressures. The series OH, illustrated herewith, is for low ranges of differential pressure. It is built in

Hays series OH supersensitive recorder for low ranges of differential pressure

rugged, rectangular cases, with 10-inch chart providing more than 3 inches of pen travel for ranges of draft, pressure of differential between 0 to 0.1-inch and 0 to 0.4-inch water. Actuating mechanism is a 7-inch round slack leather diaphragm.

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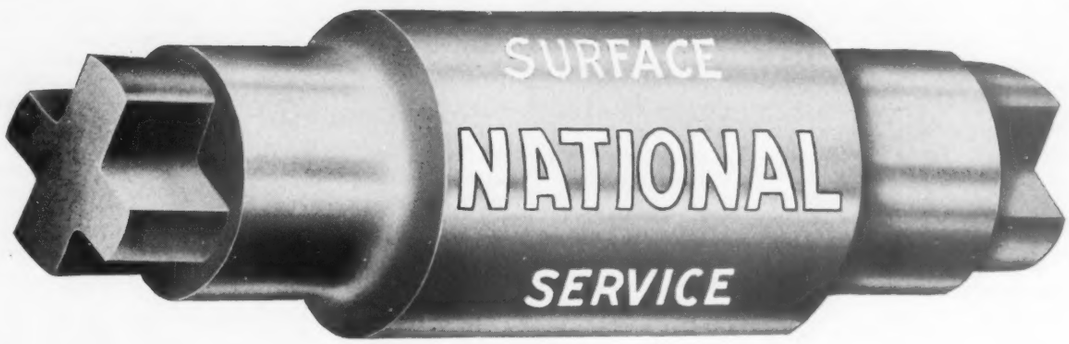
Fire Extinguishers

Pyrene Mfg. Co., Newark, N. J., announces a new 2-quart, vaporizing liquid, fire extinguisher that is discharged by air pressure and delivers a fan-shaped spray as well as a solid stream. It is recommended for incipient fires in all classes of material and particularly for flammable liquids and electrical fires. It weights 16½ pounds when fully charged and is operated by opening the operating valve.

Vaporizing liquid is discharged from this new Pyrene extinguisher in fan-shaped spray as well as in solid stream

"NATIONAL" ROLL



We specialize in

ROLLING MILL MACHINERY

SPECIAL CHILLED ROLLS
SAND ROLLS

ROLLS

PLAIN CHILLED ROLLS
COLD ROLLS

EXTRA HARD ROLLS FOR BRASS, COPPER, ALUMINUM, ZINC

SPECIAL CONTACT ROLLS FOR FOUR-HIGH MILLS

The National Roll & Foundry Company
Office and Works: AVONMORE, PA., U.S.A.

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New Trade Publications

CIRCUIT BREAKER—General Electric Co., Schenectady, N. Y., in bulletin No. 2050 describes a moderate capacity oil-blast circuit breaker, type FK-43.

FORGED FLANGES—Kropp Forge Co., 5301 West Roosevelt road, Chicago, in a recent bulletin describes and illustrates its various types of forged flanges.

TRACTORS—Caterpillar Tractor Co., Peoria, Ill., has prepared a bulletin featuring its orchard model tractor with features fitting it for use in a specialized field.

PRESS—Niagara Machine & Tool Works, Buffalo, has issued a bulletin on its A-5 heavy duty presses, illustrating various types, with details and description of new features.

BOILER TUBES—Williams & Co. Inc., 1748 East Twenty-second street, Cleveland, has issued a leaflet on its charcoal iron, electrunite steel, lapweld steel and seamless steel boiler tubes.

MIXERS—Patterson Foundry & Machine Co., East Liverpool, O., in a current bulletin illustrates and describes its line of mixers for various uses, with motor or belt drive and special stirrers.

SPRAY PAINTING—Binks Mfg. Co., 3114 Carroll avenue, Chicago, has issued a new edition of its bulletin AD-114, containing additions to the company's line of spray painting and finishing equipment.

MOTORS—Louis Allis Co., Milwaukee, in a bi-monthly publication presents engineering data and technical articles on electric motors and other equipment and material of general interest.

LUBRICATION—Texas Co., 135 East Forty-second street, New York, in its series on lubrication, March issue, treats of lubrication tolerance and the application of steam cylinder oil, with illustrations.

ELECTRIC EQUIPMENT—Benjamin Electric Mfg. Co., Des Plaines, Ill., has issued its catalog No. 26, well illustrated and containing engineering data on reflectors, lighting equipment, floodlights, fittings, sockets and signals.

S.A.E. SPECIFICATIONS—Republic Steel Corp., Youngstown, O., has reprinted a chart of S.A.E. steel specifications, chemical compositions, revised to January, 1935. The advertising department, Massillon, O., will supply it free.

FORGING MACHINES — National Machinery Co., Tiffin, O., has issued a bulletin on its forging machines and progress made in forging by this means. Illustrations show several of its products.

JACKS—A miniature catalog, No. 235, by Templeton, Kenly & Co., 1020 South Central avenue, Chicago, illustrates and describes simplex screw and lever jacks, trench and timber braces.

CHAIN DRIVE—Link-Belt Co., 910 South Michigan avenue, Chicago, in its book No. 1425 features its silver streak silent chain, highly pictorial, to show what has been done and can be done for its users. Many types of application, on short and long centers, are presented.

TRAMRAIL—Cleveland Tramrail division of Cleveland Crane & Engineering Co., Wickliffe, O., has issued a further bulletin for its loose-leaf file, suggesting increased production from use of overhead transportation of materials.

CHRONOGRAPHS—Gaertner Scientific Corp., 1201 Wrightwood avenue, Chicago, has issued catalog B1 on its chronographs and similar devices and bulletin 133 on spectrometers and accessories.

MALLETS — Lignum-Vitae Woodturning Co., 96 Boyd avenue, Jersey City, N. J., has issued a catalog and price list of its mallets and mauls of lignum vitae and other hard woods for industrial uses.

FACTS—A booklet by the Mackintosh-Hemphill Co., Pittsburgh, under the title, "Facts," contains a record of the "firsts" accomplished by this company, a history and other facts about the company and tables of technical data.

VALVES — Golden-Anderson Valve Specialty Co., Fulton building, Pittsburgh, in catalog No. 25 describes its automatic valves, with illustrations and dimension tables, the former showing cross sections and details of various types of valves for many purposes.

WELDING-CUTTING—A leaflet by the Craftweld Equipment Corp., 250 West Fifty-fourth street, New York, service bulletin No. 235, gives welding and cutting data and operating suggestions of value to the user of welding and cutting equipment.

VERTICAL SURFACE GRINDER—Pratt & Whitney Co., Hartford, Conn., has issued circular No. 410 on its 14-inch hydraulic vertical surface grinder with illustrations showing the machine and various classes of work it does efficiently.

HONING MACHINE—Barnes Drill Co., 814 Chestnut street, Rockford, Ill., has issued bulletin No. 135 describing features, advantages and specifications of its No. 5 horizontal self-oiling hydraulic honing machine. Illustrations show the machine and details.

THREADING MACHINE — Landis Machine Co., Waynesboro, Pa., in bulletin No. D-84 describes its new 1¼ and 2-inch pipe and nipple threading machine. Illustrations show the machine and its details and tables of specifications are included.

FORGED FLANGES—Taylor Forge & Pipe Works, postoffice box 485, Chicago, has issued a 96-page catalog, No. 35, on its forged steel pipe flanges, containing data and formulas approved by engineering societies. Alloy steels, joint bolting and gaskets are also discussed.

PRESS BRAKE—Lukens Steel Co., Coatesville, Pa., in a current bulletin features its new Cincinnati all-steel press brake, which is capable of producing various sections in plates up to one inch thick and lengths to 18 feet, bending, flanging, forming and multiple punching of light or heavy steel plate. Illustrations show the press, its dimensions and many of the products it can form.

ARC WELDER—Ideal Electric & Mfg. Co., Mansfield, O., has prepared a 16-page booklet, bulletin, No. 910, on its Noel speed-arc welder. Claims for this device are high power factor, high efficiency and high speed, all tending to reduce costs to the user. It is well illustrated.

SPECIAL STEEL—Wesson Co., 1050 Mt. Elliott, Detroit, has prepared a loose-leaf catalog covering its line of standard and special purpose high speed steel and cemented carbide counterbores, inverted spotfacers, multi-dimension cutters, milling cutters and reamers.

ANGLE TOOL ATTACHMENTS—C. A. Koza Inc., 464 Augustine street, Rochester, N. Y., is distributing a leaflet on its angle tool attachments for use in performing work in situations difficult to reach with standard tools. Saving of time in machine repair work is stressed.

BUCKET ELEVATOR—Jeffrey Mfg. Co., Columbus, O., in catalog No. 565, of 112 pages, covers a broad field of elevator requirements. It is helpful to the engineer in choosing the elevator type best suited to his requirements. It covers fundamentals of design, application and operation and describes details of construction.

TESTING SCREENS — Hendrick Mfg. Co., Carbondale, Pa., has issued a booklet suggesting means of choosing the testing screen best suited to the user's needs, with illustrations showing their uses and results obtained. A leaflet has also been issued, describing ornamental perforated metal and grilles and other products of this company.

DRILL GRINDERS—William Sellers & Co., Philadelphia, has issued two bulletins of interest to users of twist drills. No. 05-D covers a modern precision grinder for small twist drills, with illustrations showing method of operation. The other lists reasons why some twist drills operate efficiently and others work poorly, increasing cost of drilling. The remedy is pointed out.

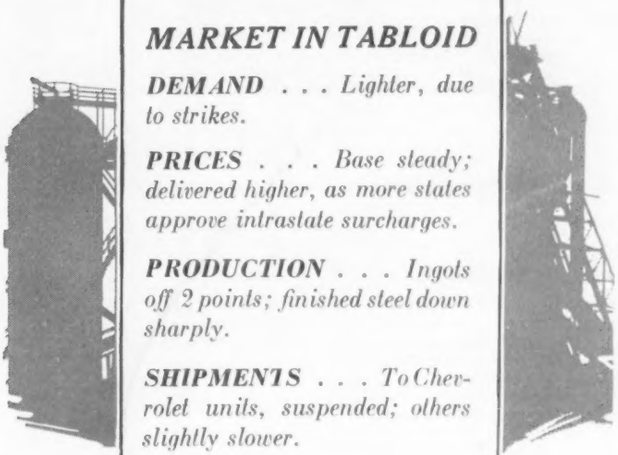
RECORDERS — Brown Instrument Co., Philadelphia, has issued a bulletin illustrating how the cost of steam generating and distribution may be reduced by accurate measuring of various factors and correction of errors shown thereby. A power plant instrument data book has been prepared to aid in the use of these measuring and recording instruments.

AIR FILTERS—Coppus Engineering Corp., Worcester, Mass., in two bulletins describes types of air filters. No. F-320-3 describes the Coppus unit type filter for motor and generator intakes and general commercial and industrial ventilation. No. F-310-2 presents data on filters for air compressors, internal combustion engines and similar use. Sizes, shapes and capacities are given in tabular form in the latter bulletin.

ADVERTISING PAGES REMOVED

Strikes Cut Output; Infuse Caution in Markets

Ingot Rate 44; Finished Steel Off Sharply on Automotive Suspensions



MARKET IN TABLOID

DEMAND *. . . Lighter, due to strikes.*

PRICES *. . . Base steady; delivered higher, as more states approve intrastate surcharges.*

PRODUCTION *. . . Ingots off 2 points; finished steel down sharply.*

SHIPMENTS *. . . To Chevrolet units, suspended; others slightly slower.*

LABOR flareups in the automobile industry last week—as serious as they appeared to be—had only a moderate restraining effect on steel ingot output, the national average receding 2 points to 44 per cent.

In finished steel the consequence was more severe. Production of full-finished sheets, used largely by automobile manufacturers, dropped 16 points to 58 per cent; common black, 3 to 64. Nut and bolt makers reported a decline of 30 per cent in releases.

While finished steel has received the full impact for the present, a further backing-up to raw steel production may result this week, operations in the Pittsburgh district and some others being scheduled at lower rates.

Automobile assemblies for the week declined about 1000 units to 110,000, but the industry apparently is confident that the showing this month will be comparable with that of April. With Chevrolet and Pontiac transmissions production tied up, General Motors is arranging for making them in other plants. If the Toledo strike is settled promptly, material releases will be issued this week; otherwise ten days or more may elapse before it has reorganized its facilities.

As a reflex of numerous strikes, as well as uncertainties pertaining to action by congress on the NRA, and its possible effect on the steel code, with its price provisions, caution was widely noted in the buying attitude of consumers last week. Outside the automobile industry the general volume of specifications was lighter. Tin plate production fell 10 points to 75 per cent.

Farm tractor and implement industries still hold close to the peak. Structural shape awards for the week increased slightly to 15,200 tons, aided by 7700 tons for a dam at Alton, Ill. Akron, Canton & Youngstown was reported to have placed 8000 tons of rails; Missouri Pacific awarded 4500 tons, and Chicago & Eastern Illinois, 2625 tons of rails and fastenings.

In raw materials, scrap prices tended toward more strength, STEEL's composite reversing the recent trend and moving up 8 cents to an index of $10. Lake Superior iron ore shipments for April exceeded producers' expectations, amounting to 400,000 tons. Ford Motor Co. closed for 180,000 tons, and additional tonnage from its own, leased mine.

Daily average pig iron output in April—55,719 gross tons—was 2.4 per cent lower than in March. The total—1,671,556 tons—was down 5.6 per cent. At the close of the month 97 stacks were operating, the same number as March 31. Production for four months—6,535,894 tons—is 11.5 per cent higher than in the period last year.

Iron and steel exports for March rose to 323,035 gross tons, a peak for the month in recent years, due to a spectacular record for scrap, 228,338 tons, slightly more than all the scrap exported in 1932. For three months, exports at 814,312 tons are 38 per cent higher than for the first quarter last year. March imports, 21,409 tons, were 26 per cent less than in February; and for three months, 73,098 tons, are only 85 per cent of those in the same period last year.

Youngstown steelworks operations last week were down 6 points to 50 per cent; Cleveland 3 to 54; Chicago 1 to 51; Buffalo 7 to 27; eastern Pennsylvania ½-point to 28½. New England was up 5 to 30, Wheeling 3 to 79. Pittsburgh held at 37; Birmingham 54½; Detroit 82.

STEEL's iron and steel price composite is unchanged at $32.30, and the finished steel index remains $54.

COMPOSITE MARKET AVERAGES

	May 4	April 27	April 20	One Month Ago April, 1935	Three Months Ago Feb., 1935	One Year Ago May, 1934	Five Years Ago May, 1930
Iron and Steel	$32.30	$32.30	$32.31	$32.29	$32.54	$32.97	$33.49
Finished Steel	54.00	54.00	54.00	54.00	54.00	54.80	52.60
Steelworks Scrap	10.00	9.92	10.00	10.05	12.03	11.30	13.65

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished Material

	May 4, 1935	April, 1935	Feb., 1935	May, 1934
Steel bars, Pittsburgh	1.80c	1.80c	1.80c	1.90c
Steel bars, Chicago	1.85	1.85	1.85	1.95
Steel bars, Philadelphia	2.11	2.09	2.09	2.19
Iron bars, Terre Haute, Ind.	1.75	1.75	1.75	1.75
Shapes, Pittsburgh	1.80	1.80	1.80	1.85
Shapes, Philadelphia	2.01½	2.00½	2.00½	2.05½
Shapes, Chicago	1.85	1.85	1.85	1.90
Tank plates, Pittsburgh	1.80	1.80	1.80	1.85
Tank plates, Philadelphia	2.00	1.98½	1.98½	2.03½
Tank plates, Chicago	1.85	1.85	1.85	1.90
Sheets, No. 10, hot rolled, Pitts.	1.85	1.85	1.85	2.00
Sheets, No. 24, hot ann., Pitts.	2.40	2.40	2.40	2.65
Sheets, No. 24, galvan., Pitts.	3.10	3.10	3.10	3.25
Sheets, No. 10, hot rolled, Gary	1.95	1.95	1.95	2.10
Sheets, No. 24, hot anneal., Gary	2.55	2.55	2.55	2.75
Sheets, No. 24, galvan., Gary	3.20	3.20	3.20	3.35
Plain wire, Pittsburgh	2.30	2.30	2.30	2.30
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25
Wire nails, Pittsburgh	2.60	2.60	2.60	2.60

Semifinished Material

Sheet bars, open-hearth, Youngs.	$28.00	$28.00	$28.00	$30.00
Sheet bars, open-hearth, Pitts.	28.00	28.00	28.00	30.00
Billets, open-hearth, Pittsburgh	27.00	27.00	27.00	29.00
Wire rods, Pittsburgh	38.00	38.00	38.00	38.00

Pig Iron

	May 4, 1935	April, 1935	Feb., 1935	May, 1934
Bessemer, del. Pittsburgh	$19.76	$19.76	$19.76	$19.76
Basic, Valley	18.00	18.00	18.00	18.00
Basic, eastern, del. eastern Pa.	19.76	19.76	19.76	19.76
No. 2, foundry, del. Pittsburgh	19.26	19.26	19.26	19.26
No. 2 foundry, Chicago	18.50	18.50	18.50	18.50
Southern No. 2, Birmingham	14.50	14.50	14.50	14.50
No. 2X eastern, del. Philadelphia	20.68	20.63	20.63	20.63
Malleable, Valley	18.50	18.50	18.50	18.50
Malleable, Chicago	18.50	18.50	18.50	18.50
Lake Superior charcoal, del. Chi.	24.25	24.15	24.04	24.04
Ferromanganese, del. Pittsburgh	90.13	89.89	89.79	90.24
Gray forge, del. Pittsburgh	18.63	18.63	18.63	18.88

Scrap

Heavy melting steel, Pittsburgh	$11.50	$11.70	$13.25	$12.80
Heavy melt. steel, No. 2, east. Pa.	9.25	9.15	10.12	8.90
Heavy melting steel, Chicago	10.00	10.05	11.65	10.85
Rails for rolling, Chicago	11.00	11.05	12.55	12.15
Railroad steel specialties, Chicago	11.25	11.25	12.50	12.40

Coke

Connellsville, furnace, ovens	$3.60	$3.60	$3.60	$3.45
Connellsville, foundry, ovens	4.60	4.60	4.60	4.60
Chicago, by-product foundry, del.	9.25	9.25	9.25	9.25

Steel, Iron, Raw Material, Fuel and Metals Prices

Prices are code levels filed with American Iron and Steel Institute, 350 Fifth avenue, New York. Except when otherwise designated, prices are base, f.o.b. cars. Asterisk denotes price change this week.

Sheet Steel

Hot Rolled No. 10, 24-48 in.

Pittsburgh	1.85c
Gary	1.95c
Chicago, delivered	1.98c
New York, del.	2.20c
*Philadelphia, del.	2.16c
Birmingham	2.00c
St. Louis, del.	2.17c
Pacific ports, f.o.b. cars, dock	2.40c

Hot Rolled Annealed No. 24

Pittsburgh	2.40c
Gary	2.50c
Chicago, delivered	2.53c
Detroit, delivered	2.60c
New York, del.	2.75c
*Philadelphia, del.	2.71c
Birmingham	2.55c
St. Louis, del.	2.72c
Pacific ports, f.o.b. cars, dock	3.05c

Galvanized No. 24

Pittsburgh	3.10c
Gary	3.20c
Chicago, delivered	3.23c
*Philadelphia, del.	3.41c
New York, del.	3.45c
Birmingham	3.25c
St. Louis, del.	3.42c
Pacific ports, f.o.b. cars, dock	3.70c

Tin Mill Black No. 28

Pittsburgh	2.75c
Gary	2.85c
St. Louis, delivered	3.07c

Cold Rolled No. 10

Pittsburgh	2.50c
Gary	2.60c
Detroit, delivered	2.70c
*Philadelphia, del.	2.81c
New York, del.	2.85c
Pacific ports, f.o.b. cars, dock	3.10c

Cold Rolled No. 20

Pittsburgh	2.95c
Gary	3.05c
Detroit, delivered	3.15c
*Philadelphia, del.	3.26c
New York, del.	3.30c

Enameling Sheets

Pittsburgh, No. 10	2.50c
Pittsburgh, No. 20	3.10c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke base con. (box) Pitts.	$5.25
Do., waste-waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted, Pitts.	3.40c
Do., Gary	3.50c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold stp.	20.50	22.00	27.00	35.00

Steel Plates

Pittsburgh	1.80c
*New York, del.	2.09c
*Philadelphia, del.	1.99c
Boston, delivered	2.22c
Buffalo, delivered	2.05c
Chicago or Gary	1.85c
Cleveland, del.	1.99½c
Birmingham	1.95c
Coatesville, base	1.90c
Sparrows Pt., base	1.90c
Pacific ports, f.o.b. cars, dock	2.35c
St. Louis, delivered	2.07c

Structural Shapes

Pittsburgh	1.80c
*Philadelphia, del.	2.01½c
*New York, del	2.06½c
*Boston, delivered	2.20½c
Bethlehem	1.90c
Chicago	1.85c
Cleveland, del.	2.00c
Buffalo	1.90c
Gulf Ports	2.20c
Birmingham	1.95c
Pacific ports, f.o.b. cars, dock	2.35c

Bars

Soft Steel

Pittsburgh	1.80c
Chicago or Gary	1.85c
Duluth	1.95c
Birmingham	1.95c
Cleveland	1.85c
Buffalo	1.90c
Detroit, delivered	1.95c
Pacific ports, f.o.b. cars, dock	2.35c
*Philadelphia, del.	2.11c
Boston, delivered	2.22c
New York, del.	2.15c
Pitts., forg. qual.	1.95c-2.05c

Rail Steel

To Manufacturing Trade

Pittsburgh	1.70c
Chicago or Gary	1.75c
Moline, Ill.	1.75c
Cleveland	1.75c
Buffalo	1.80c

Iron

Troy, N. Y.	1.70c
Terre Haute, Ind.	1.75c
Chicago	1.80c
*Philadelphia	1.91c
Pittsburgh, refined	2.75-7.50c

Reinforcing

New billet, straight lengths, quoted by distributors.

Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young.	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. cars dock	2.45c
*Philadelphia, del.	2.36c

Rail Steel

Straight lengths quoted by distributors

Pittsburgh	1.90c
Chicago, Buffalo, Cleveland, Birm., Young.	1.95c
Gulf ports	2.30c

Wire Products

(Prices apply to straight or mixed carloads; pool cars, or less, 15c up. 10% dis. on nail extras on stright or mixed carloads to one consignee.)

Base Pitts.-Cleve. 100 lb. keg.

Standard wire nails	$2.60
Cement coated nails	2.60
Galvanized nails, 15 gage and coarser	4.60c
do., 16 gage and finer	5.10c

(Per pound)

Polished staples	3.30c
Galvanized fence staples	3.55c
Barbed wire, galv.	3.00c
Annealed fence wire	2.45c
Galvanized fence wire	2.80c
Woven wire fencing (base column, c.l.)	$63.00
Plain wire, 6-9 gage to mfg. trade	2.30c

Anderson, Ind., (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire, Pittsburgh or Cleveland	2.90c

Do., Chicago up $1, Worcester, $2.

Cold-Finished Carbon Bars and Shafting

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs	1.95c
20,000 to 59,999 lbs.	1.90c
60,000 to 99,999 lbs.	1.85c
100,000 lbs. and over	1.82½c

Gary, Ind., Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Alloy Steel Bars (Hot)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.45c

S.A.E.	Alloy Diff.	S.A.E.	Alloy Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo	0.50
4600 0.20 to 0.30 Mo. 1.25-1.75 Ni.	1.05
5100 0.80-1.10 Cr	0.45
5100 Cr. spring	base
6100 bars	1.20
6100 spring	0.70
Cr., Ni., Van.	1.50
Carbon Van.	0.95

9250.....Carbon base plus extras

Piling

Pittsburgh	2.15c
Chicago, Buffalo	2.25c

Strip and Hoops

Hot strip to 23⅞-in. Pittsburgh	1.85c
Chicago, base	1.95c
Birmingham base	2.00c
Detroit, delivered	2.05c
*Philadelphia, del.	2.16c
New York, del.	2.20c
Cooperage hoop, Pittsburgh	1.95c
Chicago	2.05c
Cold-rolled strip, Pitts., Cleve.	2.60c
Worcester, Mass.	2.80c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts. 24-45 lbs.	$26.00
50-60 lbs.	$23.00
70-75 lbs.	$20.00
80-85 lbs.	$24.00
100 lbs.	$25.00
Light Rails, billet qual. Pitts., Chi.	$35.00
Do., reroll. qual.	34.00
Angle bars, mills	2.55c
Spikes, R. R. base	2.40c
Track bolts, base	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs. up $8; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots, Dec. 1, 1932, lists, 10% extra for less full containers.

Carriage Bolts

All sizes, cut thread	70-10-5 off
Rolled thread, ½ x 6, smaller	70-10-5 off

Machine Bolts

All sizes cut thread lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts stud bolts	70-10-5 off
Tire bolts	60-5 off
Stove bolts, 75 off in pkgs.; 83 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.	
Rolled thread machine, ½ x 6, smaller	70-10-5 off
Step bolts	70-5 off
Elevator bolts	70-5 off

Nuts

S.A.E. semifinished hex.; ½ to ⅞-inch	70-10-5 off
Do., ½ to 1-inch	70-10-5 off
Do., over 1-inch	70-5 off

Hexagon Cap Screws

Milled	85 off
Upset, 1-in., smaller	85 off

Square Head Set Screws

Upset, 1-in., smaller	70-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland.	2.90c
Struc., c. l., Chicago	3.00c
⅞-in. and smaller, Pitts., Chi., Cleve.	70 and 5 off
Wrought washers, Pitts., Chi., Phila., to jobbers & large nut, bolt mfrs.	$6.25 off

Cut Nails

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more no discount on size extras	$3.05
Do. under 5 kegs; no discount on size extras	$3.20

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

Butt Weld

Steel

In.	Blk.	Gal.
¼ and ⅜	53½	35
½	58½	47
¾	62	52
1—3	64	55

Iron

½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

Lap Weld

Steel

2	60	51
2½—3	63	54
3½—6	65	56
7 and 8	64	54
9 and 10	63½	53½

Iron

2	37	22½
2½—3½	38	25
4—8	40	28½

Line Pipe

Steel

½, butt weld	57½
⅛-inch, butt weld	50½
¼—⅜, butt weld	52½
¾, butt weld	61
1—3, butt weld	63
2-inch, lap weld	59
2½—3, lap weld	62
3½—6, lap weld	64
7—8, lap weld	63

Iron

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe lists, 8—12-inch, no extra.

Boiler Tubes

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¼—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 200 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 lbs., 2 points under base.

Seamless Boiler Tubes

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$39.00-40.00
4-in., Birmingham	42.00-43.00
4-in., Chicago	50.40-51.40
6 to 24-in. Chicago	47.40-48.40
6-in. & over, east fdy.	43.00
Do., 4-in.	46.00

Class A pipe $3 over Class B.

Stnd. fitgs., Birm. base	$100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., and Youngstown	$27.00
*Philadelphia	32.67
Duluth	31.00
Forging, Pitts., Chi. and Buffalo	32.00
Forging, Duluth	36.00

Sheet Bars

Pitts., Cleve., Young., Chi., Buff., Canton, Sparrows Pt.	28.00

Slabs

Pitts., Cleve., Young.	27.00

Wire Rods

(Common; combination up $2)

Pitts., Cleveland	38.00
Chicago	39.00
Worcester, Mass.	40.00

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Point	1.70c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.60
Connellsville, fdry.	4.60
Connel. prem. fdry.	5.10
New River fdry.	6.00
Wise county fdry.	4.45- 5.25
Wise county fur.	4.00- 4.50

By-Product Foundry

Newark, N. J., del.	9.20- 9.65
Chi., ov., outside del.	8.50
Chicago, del.	9.25
New England, del.	11.00
St. Louis, del.	9.25
Birmingham, ovens	6.00
Indianapolis, del.	8.75
Cincinnati, del.	9.30
Cleveland, del.	9.25
Buffalo, ovens	7.50- 8.00
Detroit ov., out. del.	8.50
*Philadelphia, del.	9.03

Coke By-Products

Per gallon, producers' plants.

	Tank lots	Spot
Pure and 90% benzol		15.00c
Toluol		30.00c
Solvent naphtha		30.00c
Commercial xylol		30.00c

Per lb. f.o.b. New York.

Phenol (200 lb. drums)	16.30c
Do. (100 lbs.)	17.30c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls.	5.00c

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.20

†Western prices, ½-cent up.

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$19.50	$20.00	$19.00	$20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Birmingham, Ala., southern del.	14.50	14.50	13.50	19.00
Buffalo	18.50	19.00	17.50	19.50
Chicago	18.50	18.50	18.00	19.00
Cleveland	18.50	18.50	18.00	19.00
Detroit	18.50	18.50	18.00	19.00
Duluth	19.00	19.00	.....	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Everett, Mass.	19.50	20.00	19.00	20.50
Hamilton, O.	18.50	18.50	18.00	19.00
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Sparrows Point, Md.	19.50	.....	19.00	.....
Swedeland, Pa.	19.50	20.00	19.00	20.50
Toledo, O.	18.50	18.50	18.00	19.00
Youngstown, O.	18.50	18.50	18.00	19.00
Delivered from Basing Points:				
Akron, O., from Cleveland	19.76	19.76	19.26	20.26
*Baltimore from Birmingham	20.08	.....	19.96	.....
Boston from Birmingham	19.62	.....	19.50	.....
Boston from Everett, Mass.	20.00	20.50	19.50	21.00
Boston from Buffalo	20.00	20.50	19.50	21.00
Brooklyn, N. Y., from Bethlehem	21.93	22.43	.....	.....
Brooklyn, N. Y., from Bmghm.	21.55	.....	.....	.....
Canton, O., from Cleveland	19.76	19.76	19.26	20.26
Chicago from Birmingham	†18.72	.....	18.60	.....
Cincinnati from Hamilton, O.	19.51	19.51	19.01	.....
Cincinnati from Birmingham	19.38	.....	19.40	.....
Cleveland from Birmingham	19.04	.....	18.92	.....
Indianapolis from Hamilton, O.	20.93	20.93	20.43	21.43
Mansfield, O., from Toledo, O.	20.26	20.26	19.76	20.76
Milwaukee from Chicago	19.57	19.57	19.07	20.07
Muskegon, Mich., from Chicago, Toledo or Detroit	21.60	21.60	21.10	22.10
Newark, N. J., from Birmingham	20.61	.....	.....	.....
Newark, N. J., from Bethlehem.	20.99	21.49	.....	.....
*Philadelphia from Birmingham.	19.93	.....	19.81	.....
*Philadelphia from Swedeland, Pa.	20.31	20.81	19.81	.....
Pittsburgh district from Neville Island	Neville base plus 63c, 76c and $1.13 switching charges			
*Saginaw, Mich., from Detroit	20.75	20.75	20.25	20.25

Delivered from Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis, northern	19.00	19.00	18.50	.....
St. Louis from Birmingham	†18.62	.....	18.50	.....
St. Paul from Duluth	20.94	20.94	.....	21.44

†Over 0.70 phos.

Low Phos

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $23.50. Phila. base, standard and copper bearing, $24.63.

Gray Forge		Charcoal	
Valley furnace	18.00	Lake Superior fur.	21.00
Pitts. dist. fur.	18.00	Do., del. Chicago	24.25
		Lyle, Tenn.	21.50

Silvery†

Jackson County, O., base; 6% $22.75; 7—$23.75; 8—$24.75; 9—$25.70; 10—$26.75; 11—$27.75. Buffalo base prices, up $1.25.

Bessemer Ferrosilicon†

Jackson County, O., base; 10%—$27.75; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25. Buffalo base prices $1.25 higher.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Refractories

Per 1000 f.o.b. Works

Fire Clay Brick

First Quality.

Pa., Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	45.00
Second Quality	
Pa., Ill., Ky., Md., Mo., Ga., Ala.	40.00
Ohio	
First quality	$40.00-45.00
Intermediary	37.00
Second quality	28.00

Malleable Bung Brick

All bases	50.00

Silica Brick

Pennsylvania	$45.00
Joliet, E. Chicago	54.00
Birmingham, Ala.	52.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	$45.00
Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags)	40.00
Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk)	22.00

Basic Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	$45.00
Chemically bonded chrome brick	42.50
Magnesite brick	65.00
Chemically bonded magnesite brick	55.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton	$18.75-19.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$13.00-14.00

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
Do., Balti. base	85.00
Do., del. Pittsburgh	90.13
Spiegeleisen, 19-20% dom. Palmerton, Pa., spot†	26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight all., cl.	77.50
Do., less carload	85.00
Do., 75 per cent	126-130.00
Spot, $5 a ton higher.	
Silicomang., 2½ carb.	90.00
2% carbon, 95.00; 1%,	105.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Ferrotungsten, stand., lb. cont. del.	1.35- 1.45
Ferrovanadium, 35 to 40% lb., cont., on analysis	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, $2 unitage	50.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	65.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads, Quan. diff. apply.

Nonferrous Prices

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Chinese Spot, N. Y.	Nickel Cathodes
April 27	9.00	9.12½	7.60	50.60	49.60	3.75	3.60	4.10	*19.00	14.25	35.00
April 29	9.00	9.12½	7.60	50.37½	49.50	3.75	3.60	4.10	*19.00	14.25	35.00
April 30	9.00	9.12½	7.60	50.87½	50.00	3.75	3.60	4.10	*19.00	14.25	35.00
May 1	9.00	9.12½	7.60	50.87½	49.80	3.75	3.60	4.10	*19.00	14.25	35.00
May 2	9.00	9.12½	7.75	50.55	49.50	3.75	3.60	4.10	*19.00	14.25	35.00
May 3	9.00	9.12½	7.75	50.55	49.45	3.75	3.60	4.10	*19.00	14.25	35.00

*Nominal range 19.00 to 21.00c.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper, brass products based on 9.00c Conn. copper.

Sheets	
Yellow brass (high)	14.25
Copper, hot rolled	16.00
Lead, cut, to jobbers	7.50
Zinc, 100-lb. base	9.50
Tubes and Pipes	
High yellow brass	16.00
Seamless copper	16.25
Rods	
High yellow brass	12.75
Copper, hot rolled	13.25
Anodes	
Copper, untrimmed	13.75
Wire	
Yellow brass (high)	14.75

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass	
New York	4.50- 4.75
Cleveland	5.25- 5.50
*Chicago	4.62½-4.87½
*St. Louis	4.75- 5.00
Heavy Copper and Wire	
New York	5.87½-6.12½
Chicago, No. 1	5.75- 6.00
Cleveland	5.75- 6.00
*St. Louis	5.25- 5.50
Composition Brass Borings	
New York	4.00- 4.25
Light Copper	
New York	4.75- 5.00
*Chicago	4.37½-4.62½
*St. Louis	4.75- 5.00
St. Louis	5.00- 5.12½
Light Brass	
Chicago	2.25- 2.50
Cleveland	2.50- 2.75
Lead	
New York	2.75- 2.87½
Cleveland	2.50- 2.75
*Chicago	2.75- 3.00
*St. Louis	2.85- 3.10
Zinc	
New York	2.00- 2.25
Cleveland	2.00- 2.25
St. Louis	2.25- 2.50
Aluminum	
Borings, Cleveland	8.00- 8.25
Mixed, cast, Clev.	11.75-12.25
Mixed, cast, St. L.	12.75-13.00
Clips, soft, Clev.	13.50-13.75

SECONDARY METALS

Brass ingot, 85-5-5-5	8.00
Stand. No. 12 Alum.	15.75-17.00

Iron and Steel Scrap Prices

Corrected to Friday night Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	8.50- 9.00
Boston, dock, expt.	8.50
Boston, domestic	7.00- 7.25
Buffalo, No. 1	10.00-10.50
Buffalo, No. 2	8.25- 8.50
Chicago, No. 1	9.75-10.00
Cleveland, No. 1	9.00- 9.50
Cleveland, No. 2	8.50- 9.00
Detroit, No. 1	7.50- 8.00
Detroit, No. 2	6.50- 7.00
Eastern Pa., No. 1	10.00-10.50
Eastern Pa., No. 2	9.00
Federal, Ill.	7.75- 8.25
Granite City, R. R.	8.25- 8.75
Granite City, No. 2	7.00- 7.50
N. Y., deal, No. 2	7.00
N. Y., deal. barge	8.50
Pittsburgh, No. 1	11.25-11.75
Pittsburgh, No. 2	10.00-10.50
St. Louis	7.25- 7.75
Valleys, No. 1	11.00

COMPRESSED SHEETS

Buffalo, dealers	8.25- 8.50
Chicago, factory	8.50- 9.00
Chicago, dealer	7.50- 8.00
Cleveland	8.00- 8.50
Detroit	7.75- 8.25
E. Pa., new mat.	9.50
Pittsburgh	10.75-11.25
St. Louis	6.25- 6.75
Valleys	10.00

BUNDLED SHEETS

Buffalo	6.50- 7.00
Cincinnati, del.	6.00- 6.50
Cleveland	6.00- 6.50
Pittsburgh	7.50- 8.00
St. Louis	4.50- 5.00

SHEET CLIPPINGS, LOOSE

Chicago	5.50- 6.00
Cincinnati	5.50- 6.00
Detroit	5.00- 5.50
St. Louis	4.25- 4.75

STEEL RAILS, SHORT

Birmingham	11.50-12.00
Buffalo	11.50-12.00
Chicago (3 ft.)	12.00-12.50
Chicago (2 ft.)	12.50-13.00
Cincinnati, del.	11.00-11.50
Detroit	9.50-10.00
Pitts., open-hearth, 3 ft. and less	14.00-14.50
St. Louis, 2 ft.& less	12.00-12.50

STEEL RAILS, SCRAP

Boston	7.00- 7.25
Chicago	9.75-10.00
Pittsburgh	11.50-12.00
St. Louis	9.00- 9.50

STOVE PLATE

Birmingham	5.75- 6.25
Boston, dealers	3.75- 4.00
Buffalo	9.00- 9.50
Chicago, net	6.00- 6.50
Cincinnati, dealers	5.50- 6.00
Detroit, net	5.75- 6.25
Eastern Pa.	8.00
N. Y., deal. fdry.	6.00
St. Louis	5.50- 6.00

COUPLERS, SPRINGS

Buffalo	12.75-13.25
Chicago, springs	11.00-11.50
Eastern Pa.	13.50
Pittsburgh	14.00-14.50
St. Louis	9.25- 9.50

ANGLE BARS—STEEL

Chicago	11.00-11.50
St. Louis	9.50-10.00

RAILROAD SPECIALTIES

Chicago	11.00-11.50

LOW PHOSPHORUS

Buffalo, billets and bloom crops	12.00-12.50
Cleveland, billet, bloom crops	14.00-14.50
Eastern Pa., crops	13.00-14.00
Pittsburgh, billet, bloom crops	15.00-15.50
Pittsburgh, sheet bar crops	13.50-14.00
Pittsburgh, plate	13.25-13.75

FROGS, SWITCHES

Chicago	9.75-10.00
St. Louis, cut	9.00- 9.50

SHOVELING STEEL

Chicago	9.75-10.00
Federal, Ill.	7.50- 8.00
Granite City, Ill	7.75- 8.25

RAILROAD WROUGHT

Birmingham	7.00- 7.50
Boston, dealers	6.00- 6.50
Buffalo, No. 1	8.25- 8.50
Buffalo, No. 2	10.00-10.50
Chicago, No. 1, net	8.50- 9.00
Chicago, No. 2	9.75-10.00
Cincinnati, No. 2	7.50- 8.00
Eastern Pa.	10.00-10.50
N. Y., No. 1, deal.	7.25- 7.75
St. Louis, No. 1	6.50- 7.00
St. Louis, No. 2	7.50- 8.00

SPECIFICATION PIPE

Boston	3.00- 3.25
Eastern Pa.	9.00- 9.50
New York, dealers	3.50- 4.00

BUSHELING

Buffalo, No. 1	8.25- 8.50
Chicago, No. 1	8.00- 8.50
Cinci., No. 1, deal.	6.00- 6.50
Cincinnati, No. 2	2.75- 3.25
Cleveland, No. 2	6.00- 6.50
Detroit, No. 1, new	6.50- 7.00
Valleys, new, No. 1	10.00

MACHINE TURNINGS

Birmingham	3.50- 4.00
Boston, dealers	1.50- 1.75
Buffalo	4.50- 5.00
Chicago	5.00- 5.50
Cincinnati, dealers	3.50- 4.00
Cleveland	5.00- 5.50
Detroit	3.50- 4.00
Eastern Pa.	5.50- 6.00
New York, dealers	1.75- 2.25
Pittsburgh	7.75- 8.25
St. Louis	2.25- 2.75
Valleys	7.75- 8.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	3.25- 3.50
Buffalo	5.75- 6.25
Cincinnati, dealers	4.50- 5.00
Cleveland	6.00- 6.50
Detroit	4.50- 5.00
Eastern Pa.	5.00
New York, dealers	1.50- 1.75
Pittsburgh	6.00- 6.50

CAST IRON BORINGS

Birmingham, plain	3.50- 4.00
Boston, chemical	5.50- 6.50
Boston, dealers	3.25- 3.50
Buffalo	5.75- 6.25
Chicago	5.00- 5.50
Cincinnati, dealers	3.50- 4.00
Cleveland	6.50- 7.00
Detroit	4.50- 5.00
E. Pa., chemical	11.00-12.00
New York, dealers	1.50- 1.75
St. Louis	2.00- 2.50

PIPE AND FLUES

Cincinnati, dealers	5.00- 5.50

RAILROAD GRATE BARS

Buffalo	7.00- 7.50
Chicago, net	6.00- 6.50
Cincinnati	4.00- 4.50
Eastern Pa.	8.00
New York, dealers	4.00- 4.50
St. Louis	4.50- 5.00

FORGE FLASHINGS

Boston, dealers	4.50- 4.75
Buffalo	8.50- 9.00
Cleveland	8.00- 8.50
Detroit	6.50- 7.00
Pittsburgh	10.00-10.50

FORGE SCRAP

Boston, dealers	4.50- 4.75
Chicago, heavy	10.50-11.00
Eastern Pa.	9.50-10.00

ARCH BARS, TRANSOMS

St. Louis	10.00-10.50

AXLE TURNINGS

Boston, dealers	3.00- 3.50
Buffalo	7.50- 8.00
Chicago, elec. fur.	9.50-10.00
Cleveland	7.00- 7.50
Eastern Pa.	9.00
St. Louis	7.00- 7.50

STEEL CAR AXLES

Birmingham	12.00-12.50
Boston, ship. point	10.00-10.50
Buffalo	12.00-12.50
Chicago, net	13.50-14.00
Eastern Pa.	16.00
St. Louis	12.00-12.50

SHAFTING

Boston, ship. point	11.75-12.00
Eastern Pa.	16.50
New York dealers	12.00-12.50
St. Louis	11.00-11.50

CAR WHEELS

Birmingham	8.00- 9.00
Boston, iron deal.	5.25- 5.50
Buffalo, iron	11.00-11.50
Buffalo, steel	12.00-12.50
Chicago, iron	10.50-11.00
Chicago, rolled steel	10.50-11.00
Cincinnati, iron	8.00- 8.50
Eastern Pa., iron	10.50-11.00
Eastern Pa., steel	13.50
Pittsburgh, iron	12.00-12.50
Pittsburgh, steel	14.00-14.50
St. Louis, iron	7.50- 8.00
St. Louis, steel	9.50-10.00

NO. 1 CAST SCRAP

Birmingham	8.50- 9.00
Boston, No. 1 mach.	8.50- 9.00
Boston, No. 2	7.50- 8.00
Boston, tex. con.	8.50- 9.00
Buffalo, cupola	10.50-11.00
Buffalo, mach.	10.25-10.75
Chicago, agri. net	8.00- 8.50
Chicago, auto	9.00- 9.50
Chicago, mach. net	9.00- 9.50
Chicago, railr'd net	8.00- 8.50
Cinci., mach. cup	8.50 9.00
Cleveland, cupola	11.50-12.00
Detroit, net	9.50-10.00
Eastern Pa., cupola	11.00-12.00
E. Pa., mixed yard	8.50- 9.50
Pittsburgh, cupola	11.75-12.25
San Francisco, del.	13.50-14.00
Seattle	7.00- 8.50
St. Louis, No. 1	8.00- 8.50
St. L., No. 1 mach.	9.00- 9.50

HEAVY CAST

Boston, del.	4.75- 5.00
Buffalo, break.	8.00- 8.50
Cleveland, break.	7.50- 8.00
Detroit, auto, net	9.50-10.00
Detroit, break.	7.00- 7.50
Detroit, auto net	9.50-10.00
Eastern Pa.	10.00-10.50
N. Y., break. deal.	5.50- 5.75
Pittsburgh	10.75-11.25

MALLEABLE

Birmingham, R. R.	8.50- 9.50
Boston, consum.	12.00-12.50
Buffalo	12.00-12.50
Chicago, R. R.	12.50-13.00
Cincinnati, agri. del.	8.25- 8.75
Cleveland, rail	12.00-12.50
Detroit, auto	10.00-10.50
St. Louis, R. R.	9.50-10.00
Eastern Pa., R. R.	11.00-11.50

RAILS FOR ROLLING

5 feet and over

Birmingham	10.00-10.50
Boston, dealers	8.00- 8.50
Buffalo	10.00-11.00
Chicago	10.75-11.25
Eastern Pa.	12.50-13.00
New York, dealer	7.50- 8.00
St. Louis	10.00-10.50

LOCOMOTIVE TIRES

Chicago (cut)	11.00-11.50
St. Louis, No. 1	9.00- 9.50

LOW PHOS. PUNCHINGS

Buffalo	12.00-12.50
Chicago	11.50-12.00
Eastern Pa.	13.00-14.00
Pittsburgh	13.00-13.50

Iron Ore

Lake Superior Ore

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

Eastern Local Ores

Cents, unit, del. E. Pa.

Foundry and basic 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

Foreign Ore

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.00
No. Afr. low phos.	10.00
Swedish basic, 65%	9.00
Swedish low phos.	10.00
Spanish No. Africa basic, 50 to 60%	9.00
Tungsten, spot, sh. ton unit, duty pd.	$17.75-18.25
N. F. fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	$18.00-19.50

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots.

Caucasian, 52-55%	26.00
So. African, 52%	26.00
So. Afr., 49-51%	24.00
Indian, 58-60%	nominal
Indian, 48-50%	nominal

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

	STEEL BARS	IRON BARS	REINFORCING BARS
Baltimore*	2.90c	3.40c	2.60c
Boston††	2.95c	3.31c	3.31c
Buffalo	3.00c	3.00c	2.10c-2.60c
Chattanooga	3.31c	2.75c	
Chicago	2.95c	3.17c	
Cincinnati	3.17c	3.32c	
Cleveland	2.95c	2.90c	
Detroit	3.03½c	3.19c	
Houston	3.00c	3.25c	
Los Angeles	3.60c		
Milwaukee	3.06c		
New Orleans	3.30c		
New York‡(d)	3.22c		
Pittsburgh(h)	2.90c		
Philadelphia*	2.90c		
San Francisco	3.60c		
Seattle	3.60c		
St. Louis	3.19c		
St. Paul	3.00c		
Tulsa	3.25c		

	STEEL BARS	SHAPES
Cleveland (c)	2.10c	2.95c
Cincinnati	3.25c	3.17c
Houston	3.25c	3.25c
Los Ang., cl.	2.45c	3.56c
New Orleans	3.50c	3.20c
Pitts., plain (h)	3.05c	3.42c
Pitts., twisted squares (h)	3.175c	3.31c
San Francisco	2.45c	3.40c
Seattle	2.45c	3.00c
St. Louis	3.24c	3.60c
Tulsa	3.25c	3.31c
Young.	2.30c-2.60c	3.55c
Baltimore*		3.40c
Boston††		2.95c
Buffalo		4.95c
Chattanooga		3.15c
Chicago		3.55c
Cincinnati		3.55c
Cleveland		3.44c
Detroit		3.25c
Houston		3.50c
Los Angeles		
Milwaukee		
New Orleans		
New York(d)		
Philadelphia*		
Pittsburgh(h)		
Portland		
San Francisco		
Seattle		
St. Louis		
St. Paul		
Tulsa		

	PLATES	NO. 10 BLUE
Baltimore*	2.95c	3.05c
Boston††	3.18c	3.25c
Buffalo	3.37c	3.62c
Chattanooga	3.56c	3.36c
Chicago	3.20c	3.05c
Cincinnati	3.42c	3.22c
Cleveland, ¼-in. and over	3.31c	3.11c
Detroit	3.40c	3.13½c
Detroit, ⅜-in.	3.65 c	3.35c
Houston	3.00c	3.70c
Los Angeles	3.60c	
Milwaukee	3.31c	
New Orleans	3.55c	
New York(d)	3.40c	
Philadelphia*	2.95c	
Phila. floor	4.95c	
Pittsburgh(h)	3.15c	
Portland	3.55c	
San Francisco	3.55c	
Seattle	3.55c	
St. Louis	3.44c	
St. Paul	3.25c	
Tulsa	3.50c	

	NO. 24 BLACK	NO. 24 GALV. SHEETS
Baltimore*†	3.51c	4.21c
Boston (g)	3.90c	4.00c
Buffalo	3.25c	4.60c
Chattanooga	4.21c	4.86c
Chicago	3.85c	4.55c
Cincinnati	4.07c	4.72c
Cleveland	3.91c	4.61c
Detroit	3.98½c	4.70c
Los Angeles	4.35c	4.40c
Milwaukee	3.96c	4.95c
New York	3.85c	4.66c
Philadelphia*†	3.55c	4.50c
Pitts.** (h)	3.55c	4.50c
Portland	4.40c	4.25c
San Francisco	4.40c	5.00c
Seattle	4.40c	5.00c
St. Louis	4.09c	4.79c
St. Paul	3.695c	4.19c
Tulsa	4.75c	5.10c

	BANDS	COLD FIN. STEEL
Baltimore*	3.15c	3.56c
Boston††	3.25c	3.60c-3.85c
Buffalo	3.42c	3.40c
Chattanooga	3.61c	3.98c
Chicago	3.30c	3.35c
Cincinnati	3.47c	3.57c
Cleveland	3.36c	3.35c
Detroit, ⅜-in. and lighter	3.38½c	3.48½c
Houston	3.25c	5.70c
Los Angeles	4.10c	3.46c
Milwaukee	3.41c	4.15c
New Orleans	3.95c	3.77c-4.27c
New York(d)	3.52c	3.58c
Philadelphia	3.15c	3.20c
Pittsburgh(h)	3.20c	5.85c
Portland	4.25c	5.80c
San Francisco	4.25c	5.85c
Seattle	4.25c	3.59c
St. Louis	3.54c	3.05c
St. Paul	3.20c	4.50c
Tulsa	3.45c	

	HOOPS	COLD ROLLED STRIP
Baltimore	2.30c	5.35c
Boston	4.25c	3.39c
Buffalo	3.42c	3.27c
Chicago	3.30c	3.44c
Cincinnati	3.47c	3.20c
Det., No. 14 and lighter	3.38½c	3.33c
Los Angeles	5.85c	4.70c
Milwaukee	3.41c	3.36c
New York	3.52c	
Philadelphia	3.40c	

	COLD ROLLED STRIP	TOOL STEELS
Boston, 0.100-in., 500 lb. lots	5.35c	Base
Buffalo	3.39c	
Chicago	3.27c	
Cincinnati (b)	3.44c	
Cleveland (b)	3.20c	
Detroit	3.33c	
New York	4.70c	
St. Louis	3.36c	

(Applying on or east of Mississippi river; west of Mississippi 1c up)

	Base
High speed	57c
High carbon, high chrome	37c
Oil hardening	22c
Special tool	20c
Extra tool	17c
Regular tool	14c

Uniform extras apply

BOLTS AND NUTS

(100 pounds or over)

	Discount
Chicago (a)	70
Cleveland	70
Detroit	70
Milwaukee	70
Pittsburgh	70

(a) Under 100 pounds, 65 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Minus quant. diff.; (e) New mill classif.; (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less.

‡Domestic bars; *Plus quan. extras; **Under 25 bundles; *†50 or more bundles; †New extras apply; ††Base 40,000 lbs., extras on less.

Prices on heavier lines are subject to new quantity differentials; 399 lbs. and less, up 50 cts.; 400 to 9999 lbs., base; 10,000 to 19,999 lbs., 15 cts. under; 20,000 to 39,999 lbs., 25 cts. under; 40,000 lbs. and over, 35 cts. under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, May 2

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

PIG IRON	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
Foundry, 2.50-3.00 Silicon	$15.13 3 2 6	$13.83	1 14 0
Basic bessemer	15.13 3 2 6*	13.01	1 12 0
Hematite, Phos. .03-.05	15.25 3 3 0	.....	.....
SEMIFINISHED STEEL			
Billets	$26.62 5 10 0	$19.12	2 7 0
Wire rods, No. 5 gage	41.14 8 10 0	36.61	4 10 0
FINISHED STEEL			
Standard rails	$37.51 7 15 0	$44.74	5 10 0
Merchant bars	1.62c 7 10 0	1.15c to 1.20c	3 2 6 to 3 5 0
Structural shapes	1.59c 7 7 6	1.14c	3 1 6
Plates, †¼ in. or 5 mm.	1.73c 8 0 0	1.52c	4 2 6
Sheets, black, 24 gage or 0.5 mm.	2.00c 9 5 0	2.14c	5 16 0††
Sheets, gal., 24 gage, corr.	2.43c 11 5 0	3.22c	8 15 0
Bands and strips	1.84c 8 10 0	1.47c	4 0 0
Plain wire, base	2.00c 9 5 0	1.97c	5 7 6
Galvanized wire, base	2.43c 11 5 0	2.30c to 2.34c	6 5 6 to 6 7 6
Wire nails, base	2.59c 12 0 0	2.12c	5 15 0
Tin plate, box 108 lbs.	$ 4.36 0 18 2	.....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d	French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$16.34 3 7 6(a)	$17.16	260	$12.54	370	$25.39	63
Basic bessemer pig iron	16.34 3 7 6(a)*	12.21	185	11.19	330	28.01 (b)	69.50
Furnace coke	3.99 0 16 6	7.92	120	3.73	110	7.66	19
Billets	26.62 5 10 0	28.38	430	14.92	440	38.89	96.50
Standard rails	1.78c 8 5 0	2.08c	694	1.65c	1,100	2.40c	132
Merchant bars	1.86c 8 12 0	1.68c	560	.90c	600	2.00c	110
Structural shapes	1.89c 8 15 0	1.65c	550	.90c	600	1.96c	107.50
Plates, †¼-in. or 5 mm.	1.96c 9 1 3	2.10c	700	1.13c	750	2.31c	127
Sheets, black	2.27c 10 10 0§	2.55c	850‡	1.24c	825‡	2.62c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	3.81c 13 0 0	4.05c	1,350	2.25c	1,500	6.73c	370
Plain wire	2.00c 9 5 0	3.39c	1,130	1.65c	1,100	3.15c	173
Bands and strips	2.02c 9 7 0	1.95c	650	1.26c	840	2.31c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel a del. Middlesbrough. b hematite. ††Close annealed

**Gold pound sterling carries a premium of 67 per cent over paper sterling.

Bars

Bar Prices, Page 72

Pittsburgh—For the second consecutive week a smaller number of orders was reported in the merchant steel bar market. The greatest cause for interruption is shipping suspensions by several bar users affected by automotive strikes. Railroads appear to be slightly heavier buyers of bars, but in small quantities, mainly for repair work. At 1.80c, base, Pittsburgh, carbon steel bars are unchanged, as are alloy bars at 2.45c, base.

Cleveland — Bar mill operations here have dropped to 50 per cent, and further reduction is in prospect, due to lighter specifications from automobile manufacturers and other consumers. Suspension at Chevrolet plants has affected demand for many finished steel products, including bars, and it is reported that in the northern Ohio steel area there are no less than 35 metal-working plant strikes or suspensions. Consumers using bars have low stocks, as indicated by frequent rush shipment specifications. March tonnage was slightly larger than that of April.

Chicago—Despite a small decrease in steel bar sales and specifications, activity generally is well maintained, particularly in demand from miscellaneous consumers. Buyers tend to order smaller lots but are in the market more frequently. Requirements of farm implement manufacturers are steady, tractor production particularly being heavy under the influence of substantial backlogs which are expected to push producers for several months. Automotive demand has receded only moderately from its recent peak.

Boston—A substantial part of the current alloy steel bar volume has been for die-lock chain at the Boston navy yard. Close to 150 tons of nickel steel bars have been bid on, Carnegie Steel Co., Pittsburgh, being awarded part at 4.246c, delivered, nine other bidders quoting 4.335c on the remainder. Cold-drawn and forging bars are making the best showing.

New York—Domestic steel bar sellers are encountering especially sharp competition from abroad, particularly from France and Belgium. In addition to tonnage handled through resellers a relatively large tonnage is being bought directly from foreign mills by local consumers. Some manufacturers of bed frames and railings are using foreign steel entirely, it is said. Local rerolling mills are attempting to meet this competition, with fair success, but regard foreign competition as fast reaching a critical point.

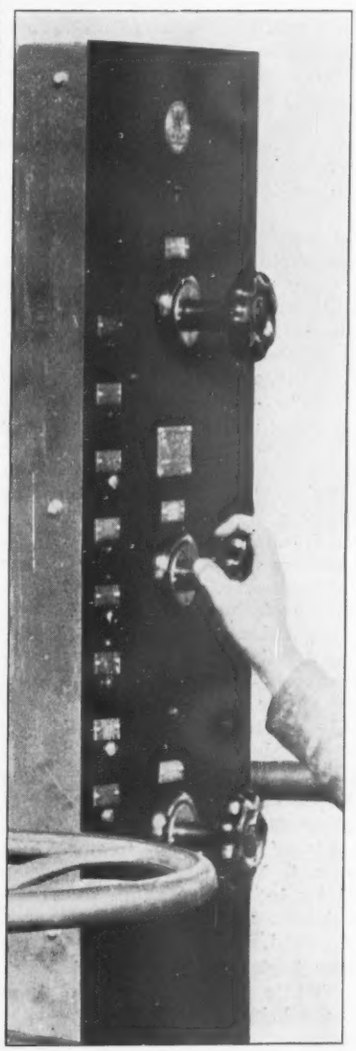
Philadelphia—The advance of 2 cents per 100 pounds in carload freight rate from Pittsburgh to this city, as a result of the application of the new surcharges to Pennsylvania intrastate freight rates, brings the delivered price on commercial steel bars up to 2.11c, Philadelphia. Little improvement is noted in volume, although agitation by cosumers for a reduction, in line with the revision in cold finished bars, is less noticeable.

Plates

Plate Prices, Page 72

Pittsburgh—Six large steel conduits of ¾-inch steel plates will be required for the Tygarts, W. Va., dam near Grafton, W. Va., requiring about 1000 tons. Although Frederick Snare Corp., New York, is general contractor on construction of this dam, the Pittsburgh army engineers will purchase these conduits separately and have asked that bids

The Ease of Electric Control



Start this motor. Stop that motor. Change the speed of another. Reverse the direction of rotation of still another.

Controlling the Landis Type 30 Roll Grinder amounts to just that. It is all accomplished from the operator's platform. No extra steps. No tugging, pulling or straining. Merely the pushing of a button or the turning of a knob. What could be easier?

Nothing probably except your sending for a copy of catalog No. H-301. It goes into complete detail about ease of control and the numerous other Type 30 Roll Grinder Features.

179

LANDIS TOOL CO.
WAYNESBORO, PA.

close May 20 at Pittsburgh. One of the most promising plate inquiries here is the American Oil Co.'s project for Hays, Pa., on which additional details are now announced. There will be seven vertical steel tanks with total capacity of 32,500 barrels and 19 horizontal tanks with a capacity of 20,000 gallons, according to preliminary plans. Considering eight all-welded steel tank barges which the American Oil Co. will require, at least 4000 tons of plates will be required here at an early date. The following bids were recently received for a 60-foot whirler derrick hull for the Memphis, Tenn., engineers, requiring 80 tons of plates: St. Louis Shipbuilding & Steel Co., $7500; Ingalls Iron Works, Birmingham, Ala., $8039. and Dravo Contracting Co., Pittsburgh, $12,400.

Bids will be opened May 13 by Memphis, Tenn., engineers for 3700 feet of pontoon discharge and shore pipe to be fabricated of ½-inch plates, the pipe to have inside diameter of 32 inches.

Cleveland — Ohio locomotive builders are figuring on 36 locomotives for the Chinese government, which will require a substantial tonnage of plates. Consumption by some plate fabricators shows considerable improvement; others are not doing so well. A lot of refinery work is in the market, but plate requirements are being placed slowly and in small lots. Railroads are buying little material. Miscellaneous plate specifications last week sustained Cleveland mill operations at 45 per cent.

Chicago—Plates continue to go largely to structural fabricators for heavy construction work, with demand from railroads still light. Miscellaneous users are taking rather small tonnages, with little betterment noted in tank demand from municipalities. Line pipe work continues inactive, with no large projects expected to be started soon. Outcome of the proposal to lay a large gas line from Texas to the Middle West remains indefinite.

Boston—About 175 tons, mainly plates, are required for standpipes at Sterling, Mass., and Hinsdale, N. H. Plate inquiry is limited to small lots. Boston & Maine railroad has reopened its locomotive shops at Billerica, Mass., and passenger car shop at Concord, N. H.

New York—Plate tonnage is lighter. While several fair-sized tank jobs are being figured little has been placed.

Philadelphia—The local delivered price on plates has been advanced ½ cent per 100 pounds to 2 cents per pound, effective May 6, when the advance in Pennsylvania intrastate rates became established. This cal-

A large tonnage order received by an Indiana steel plant demanded urgent delivery on a 15-ton crane with 100-foot span for continuous strip mill operation. Every day without it meant increased production costs.

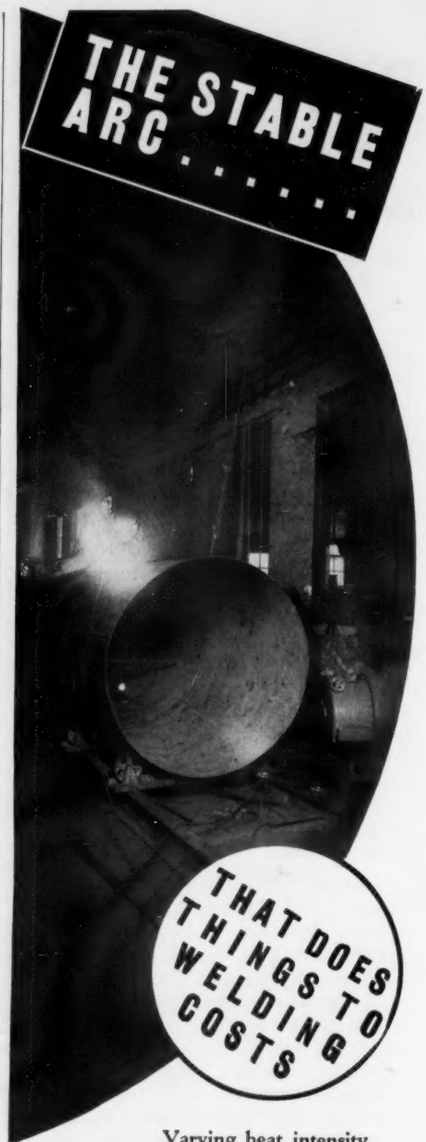
P&H engineers designed it . . . P&H shops built it . . . it was shipped 18 days from the day the order was taken.

Without such advanced production equipment, delivery could not have been made in double the time. As America's foremost builder of overhead traveling cranes, Harnischfeger offers you experience, cooperation and every facility to meet your problems — use this service.

Write for catalog 450

HARNISCHFEGER CORPORATION
4411 W. National Ave., Milwaukee, Wis.

P&H TRAVELING CRANES



Varying heat intensity at the arc results in uneven penetration, fusion and strength of welds. Welding is faster, easier, better when current uniformity is inherent. And it's done more economically, too.

P&H-Hansen's extremely uniform arc, as shown by the oscillograph record, is "built in" with an exclusive internal stabilizer winding that does away with exterior gadgets. Every gradation in current is obtained on the P&H-Hansen through the use of one simple micrometer screw. The proper setting is quickly accomplished over the entire welding range.

Ask for the complete story in Bulletin "Weld It Well."

HARNISCHFEGER CORPORATION
4411 W. National Ave., Milwaukee, Wis.

P&H HANSEN ARC WELDERS

culation of a flat ½ cent is made on the basis of a schedule approved by the carriers to simplify figuring the increases made by the new surcharges. Under this schedule carload rates on finished iron and steel from 3 to 10 cents, inclusive, take an increase of ½ cent; from 10½ to 20 cents, 1 cent; from 20½ to 28 cents, 1½ cents; and 28½ cents and over, 2 cents. Plate buying is featureless, although it is reported that the Sun Shipbuilding Co., Chester, Pa., is beginning to place some tonnage for the Erie ferryboat. Pusey & Jones, Wilmington, Del., have been definitely awarded the lightship NANTUCKET, requiring approximately 300 tons of plates and 145 tons of shapes and bars.

Birmingham, Ala.—Plate demand is rather slow and fabricating shops here are not able to keep production as steady as desired. A few tanks are being ordered, a little small craft work is being done and other outlet for plate is limited.

San Francisco—Most plate lettings are in lots of less than 100 tons and do not exceed 1100 tons in the aggregate. Chicago Bridge & Iron Works, Chicago, secured 153 tons for a tank and tower for Torrance, Calif.. Bids have been rejected on the Eureka, Calif., pipe line, calling for close to 1600 tons of plates for 24-inch pipe. It is understood that new bids will be taken. Penstocks for San Gabriel dam No. 1, for the Los Angeles county flood control district, Los Angeles, will require 1850 tons of plates, 750 tons of reinforcing bars and 500 tons of shapes for gates and trash racks.

Seattle—Plants are busy with small tonnages but larger projects are in prospect. Washington state has awarded 225 tons to unstated interests for 1936 auto license plates to be fabricated at the Walla Walla penitentiary. Bids open May 15 for 550 tons for 21 and 28-inch land pipe for the Fort Peck, Mont., project. Small boiler and tank jobs are increasing.

Contracts Placed

260 tons, 15 tanks, U. S. Industrial Alcohol Co., Baltimore, to Ingalls Iron Works Co., Birmingham, Ala.

153 tons, 150,000-gallon tank and tower, Torrance, Calif., to Chicago Bridge & Iron Works, Chicago.

100 tons, 36-inch siphon for United States Indian service, Ignacio, Colo., to unnamed interest.

Unstated tonnage, two 45-foot steel house boats, department of agriculture, Washington; to Ingalls Iron Works Co., Birmingham, Ala., at $22,075; bids March 26.

Contracts Pending

1850 tons, penstocks for San Gabriel dam No. 1, Los Angeles; bids soon.

1600 tons, pipeline, Eureka, Calif.; bids rejected.

1000 tons, 71 steel pontoons, 60 for the Vicksburg, Miss., engineers, and 11 for the Memphis, Tenn., engineers; St. Louis Shipbuilding & Steel Co., St. Louis, low at $120,000 and 60 days' completion. Ingalls Iron Works, Birmingham, Ala., second low at $126,149 and 75 days.

1000 tons, ¾-inch plates, six square conduits for Tygarts, W. Va., dam; bids May 20 to Pittsburgh army engineers.

785 tons, 48-inch steel pipe, Metropolitan district commission, Boston; bids May 16.

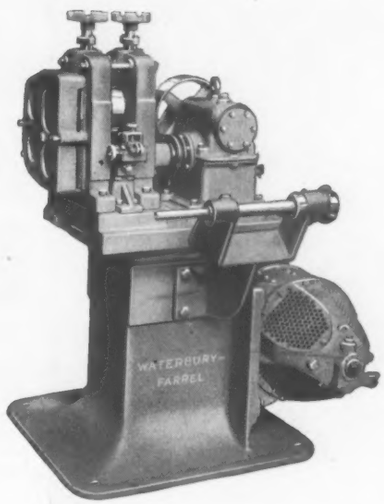
550 tons, 21 and 28-inch land pipe for Fort Peck project; bids May 15.

Sheets

Sheet Prices, Page 72

Pittsburgh — Full-finished sheet shipping suspensions began to be felt by sheet producers late last week with the result that several producing mills are scheduled for a decline in operations this week. Last week full-finished sheet operations dropped to 58 per cent from 74 per cent the week before, owing chiefly to a strike at a Detroit district mill.

Wire Flattening Mills



THE MILL SHOWN HAS 6" DIAM. X 2½" FACE ROLLS MOUNTED ON ROLLER BEARINGS. IT PRODUCES EXTREMELY ACCURATE, HIGH GRADE FLATTENED WIRE.

LET US MAKE RECOMMENDATIONS ON YOUR WIRE FLATTENING PROBLEMS.

The Waterbury Farrel Foundry and Machine Company
Waterbury, Connecticut

OFFICES
CLEVELAND CHICAGO PHILADELPHIA

Galvanized sheet output remains fairly steady at about 50 to 55 per cent, and common black is around 65 per cent, with jobbing mills on 40 to 45 per cent schedules. The effects of automotive labor unrest have spread to other consuming lines, and a general decline in incoming sheet specifications was noted last week by producers here. Base prices are steady.

Cleveland — Ford, Chrysler and some other automobile companies have placed additional orders for sheets, and the volume of specifications from refrigerator and washing machine manufacturers is holding up. Chevrolet and Fisher Body suspensions, however, last week reduced the Cleveland sheet mill operations to a rate of 50 per cent. The strike at Newton Steel Co.'s sheet mill at Monroe, Mich., was reported settled. Barrelmakers are ordering only occasional, small lots.

Chicago—Sheet demand is less active, influenced by receding orders from the automotive industry. Some reflection of the automotive strike at eastern points is noted here in a curtailment of shipments. Sheet demand from miscellaneous consumers is fairly steady, though the tendency in consumption lately has been downward.

Boston—Sheet consumers are buying close to requirements, with fewer full car shipments. Industrial demand has declined slightly, but still is the best outlet in several parts of the district.

New York—Sheet tonnage remains fairly steady, although some decline is expected shortly as oil burner manufacturers and stovemakers are approaching the end of their buying period.

Philadelphia — Effective today, the delivered prices on all grades of sheets have been advanced 2 cents per 100 pounds, due to the increase in the Pennsylvania intrastate rates to include the new surcharges which already were in effect on interstate shipments. The new rate from Pittsburgh, the basing point for this district, is now 31 cents. Sheet demand is fair, with little outstanding.

Buffalo—After rising to peak production ranging from 85 to 90 per cent sheet mills here have dropped to about 75 per cent. It is believed production at this rate will be maintained through May.

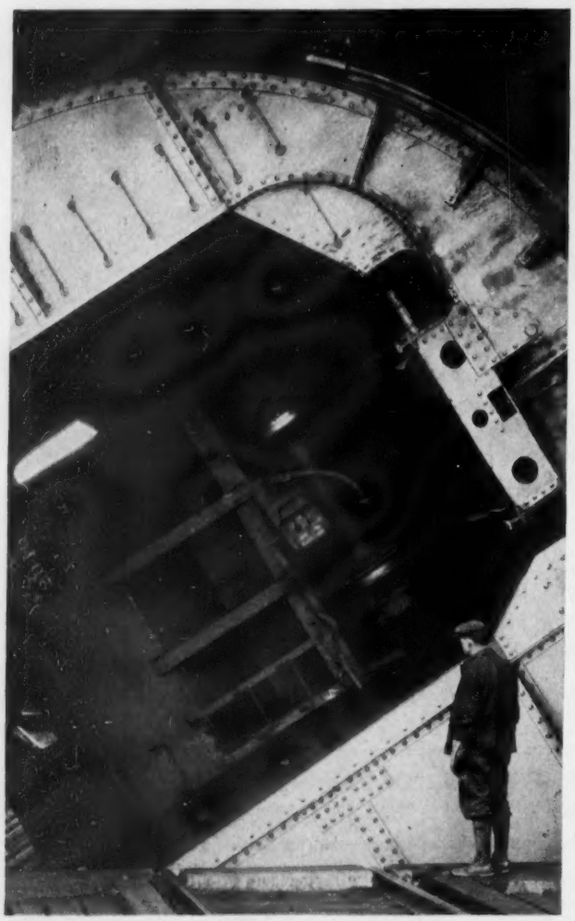
Cincinnati — Sheet mill rolling schedules are close to recent levels, with miscellaneous demand steady. Labor difficulties in automotive plants have had slight effect here. Galvanized sheet demand continues to gain.

St. Louis—Specifications are lighter, users working off inventories. Requirements of manufacturers of capital goods continue small.

Birmingham, Ala.—Demand warrants continued operation of sheet mills though not at capacity. The record for long time operation is being added to every week. Shipments are about equal to production.

San Francisco—Demand for sheets is holding up well, although the majority of orders are restricted to relatively unimportant lots. The coast mills at Torrance and Pittsburg, Calif., of Columbia Steel Co., are operating on fairly good schedules. Over 200 tons of corrugated sheets for an aircraft factory at San Diego, Calif., were placed with an unnamed interest.

Cut Unloading Costs WITH Wellman Revolving Car Dumpers



Run the car in, turn the control lever, and load's off! The first dumper of this type provided with automatic gravity clamps . . . The only dumper having clamp guides located on the side away from the material, a construction that avoids clogging of guides and sticking clamps which cause serious delays . . . The dumping side has no operating parts, nothing to obstruct free flow of material.

We also build dumpers in Turnover, Stationary, Lifting, and Movable types.

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ENGINEERS CONSTRUCTORS MANUFACTURERS
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Cold Finished

Cold Finished Prices, Page 73

Pittsburgh—Because of shipping suspension by Chevrolet considerable interruption was noted last week in cold-finished steel bar specifications. Jobbers are infrequent buyers of cold-drawn bars in view of the paper

loss which some took last month when the market was written down $3 a ton. The 1.95c, Pittsburgh, base on cold-drawn bars remains unchanged, although discussion is reported on a possible advance, at least in part, to the former 2.10c, Pittsburgh, base to become effective with the third quarter.

Transportation

Track Material Prices, Page 73

Some activity is apparent in the rail market, though lots are small. Chicago & Eastern Illinois has divided 2000 tons between Chicago mills, Missouri Pacific has awarded 4500 tons to the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., for delivery within 90 days, and the Pere Marquette is inquiring for 1100 tons. Chicago railmakers are receiving releases on contracts, giving fair operations.

It is understood the Akron, Canton & Youngstown has placed 8000 tons of steel rails with Carnegie Steel Co., Pittsburgh, and has divided 1000 tons of accessories between Carnegie Steel Co., Youngstown Sheet & Tube Co., Youngstown, O., Republic Steel Corp., Youngstown, O., and Wheeling Steel Corp., Wheeling, W. Va.

Locomotive builders are figuring on 36 locomotives for the Chinese government. Bids were opened recently by the Cundinamarca Railway, Colombia, on 72 freight cars, 30 miscellaneous coaches and four to eight locomotives. The Amtorg Trading Co., New York, has divided orders for 5000 sets of wheels and axles for freight cars between the United States Steel Corp. and the Bethlehem Steel Co.

The Reading has reopened its Philadelphia shops on a three day basis after idleness of a month.

Rail Orders Placed

Chicago & Eastern Illinois, 2000 tons to Illinois Steel Co., Chicago, 500 tons to Inland Steel Co., Chicago; 625 tons of accessories also placed.

Missouri Pacific, 4500 tons rails, 500 tons accessories, to Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.; previously reported to unnamed producer.

Car Orders Pending

Cundinamarca Railway, Colombia, 35 box cars, 17 gondolas, 15 stock cars and five flat cars; 13 third-class coaches, eight second-class coaches, three restaurant cars, two baggage cars and four rail motor cars, bids opened April 30 at company headquarters, Bogota, Colombia.

Locomotives Pending

Cundinamarca Railway, Colombia, four to eight locomotives, bids opened April 30, at company headquarters, Bogota, Colombia.

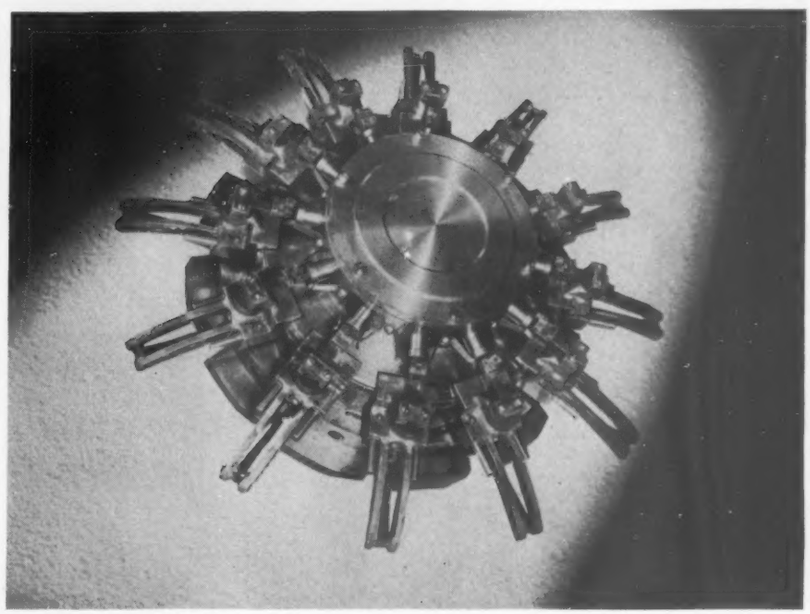
Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 73

Irregularities from 70-10-5 off on bolts and nuts continue to be noted, although on current small-lot business producers are able to maintain this discount. Apparently the lower prices are for tonnage business in such districts as Detroit and surrounding large consuming territories. Little deviation is reported from 2.90c, Pittsburgh and Cleveland, 3.00c, Chicago, on large rivets, or 70-5 off on small rivets.

Nut and bolt orders received by Cleveland manufacturers were down 25 to 30 per cent last week, due to labor difficulties in the automobile industry. Specifications from implement manufacturers showed further gains, while buying by railroads and jobbers was light.

Chicago suppliers find demand for



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6284

nuts and bolts unchanged, with jobbers and railroads taking steady shipments. Farm implement makers keep up volume of orders and road machinery builders are buying well.

Semifinished

Semifinished Prices, Page 73

A steadier rate of shipments of sheet bars will be noted at Pittsburgh this week because of lifting of a shipping suspension by a large nonintegrated sheet mill. Demand from the tin plate industry still is leading the market from the standpoint of tonnage, but has recently shown some curtailment in view of a reaction in tin mill finishing operations. Skelp and tube round specifications appear to be declining and several automotive partsmakers have issued shipping suspensions on wire rods. Pittsburgh base prices on semifinished steel at $28 for sheet bars; $27 for billets, blooms and slabs, and $38 for common wire rods, are firm.

With Pennsylvania intrastate rates now taking the new surcharge of 7 per cent, the delivered Philadelphia price on billets is $32.67 per gross ton, as against the former price of $32.30.

At Philadelphia prices for wrought iron billets according to ASTM specifications A-73-30 have been reaffirmed for the remainder of second quarter, effective May 11, at $4.30 for class A, and $3 for class B.

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Shapes

Structural Shape Prices, Page 72

New York—About 1760 tons of the 7500 tons of structural shapes for the Harlem river crossing of the Triboro bridge here, closing May 16, are specified as silicon steel. For the Bronx Kills spur several thousand tons will be up for figures in about a month. Approximately 3000 tons are pending for schools in this district.

March bookings and shipments of fabricated structural steel picked up markedly but the recovery was not sufficient to offset the losses sustained during January and February, according to the American Institute of Steel Construction. The average bookings for the first quarter of this year was approximately 10 per cent less than the average monthly bookings last year, although the bookings of March this year alone were 20 per cent larger than the monthly average of last year.

Pittsburgh — Pittsburgh Plate Glass Co., Pittsburgh, has awarded contract to Pittsburgh Bridge & Iron Co., Rochester, Pa., for a 130-ton plant addition at Creighton, Pa. Levinson Steel Co., Pittsburgh, has taken two small Pittsburgh schools, about 100 tons, and Fort Pitt Bridge Works, a 220-ton brew house at Cumberland, Md. Allegheny Country club, Sewickley, Pa., takes bids May 8 on an indoor tennis court requiring about 200 tons. Last week conditional contract was awarded to Hiler Engineering Co. for the 600-

Shape Awards Compared

	Tons
Week ended May 4	15,296
Week ended April 27	14,052
Week ended April 20	12,460
This week in 1934	41,282
Weekly average, 1934	16,284
Weekly average, 1935	15,502
Weekly average, April	15,412
Total to date, 1934	333,510
Total to date, 1935	279,044

ton Pittsburgh municipal incinerator on a bid of $485,000.

Cleveland—Award of 1380 tons to the Mount Vernon Bridge Co., Mount Vernon, O., for the Wheeler dam roadway bridge in the government's Tennessee valley project features the market. The entire award amounted to 1650 tons, 270 tons going to the Duffin Iron Works, Chicago. For the Dover dam in the Muskingum, Ohio, conservancy district 500 tons of piling is expected to be placed shortly. The state has not yet formulated its 1935 highway program, and the market here is slow.

Chicago — Structural inquiries and awards are small, both individually and collectively. Prospective business still looms rather large, with the estimate of work on which closing in the near future is anticipated placed at 40,000 to 45,000 tons. Financial arrangements are being made which are hoped to assure completion of the outer drive bridge, Chicago.

Philadelphia—A number of grade crossing elimination jobs, are expected to appear in June. Funds for these projects will be supplied entirely, it is said, by the government. Where the elimination work requires a change in railroad bed the railroad will handle the inquiry, and where the work involves a bridge over the track the county or whatever public commission is interested will handle the specifications. Structural buying is negligible. With the increase in Pennsylvania intrastate rates effective May 6 and with rates of 10½ to 20 cents inclusive calculated as taking a flat increase of 1 cent under a new schedule approved by the carriers with a view to simplification, the delivered Philadelphia price on shapes is now 2.01½c.

Birmingham, Ala. — Structural fabricating shops are fairly active. Recent awards here include 500 tons for the Kress building, Nashville, Tenn., to Ingalls Iron Works Co.; 150 tons for a church in Atlanta, Ga., also to Ingalls Iron Works Co., and 150 tons for an extension to Chevrolet automobile plant in Atlanta.

San Francisco—Structural shape awards in western states for the year to date totaled 29,595 tons, compared with 36,334 tons for the same period last year. This includes the 4600 tons, recently reported in STEEL, for the Fort Peck, Montana, dam. Columbia Steel Co. here took 148 tons for a subway for the Southern Pacific Co., San Jose, Calif.

Seattle — Tonnage pending is of fair proportions although no awards of importance were announced during the week. Seattle opened bids May 2 for fabricating 1200 tons of steel master and accommodation piles for its seawall project. The material was furnished by the Pacific Coast Steel Corp. George H. Buckler Co., Portland, Oreg., has the subcontract for constructing a $300,000 concrete mixing plant at Bonneville, Oreg., requiring a substantial tonnage.

Shape Contracts Placed

7700 tons, dam No. 26, Mississippi river, opposite Alton, Ill., to American Bridge Co., Pittsburgh.

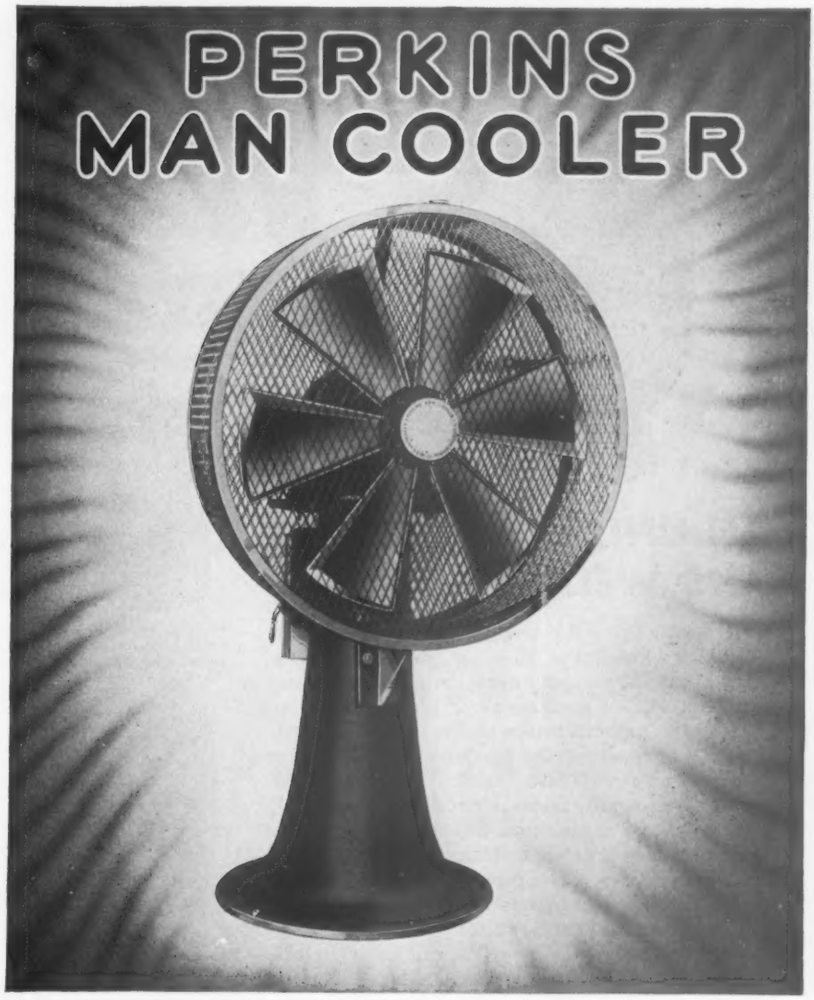
1650 tons, Wheeler dam roadway bridge, Tennessee valley project; 1380 tons to Mount Vernon Bridge Co., Mount Vernon, O., and 270 tons, Duffin Iron Works, Chicago.

585 tons, store, S. H. Kress & Co., Nashville, Tenn., to Ingalls Iron Works Co., Birmingham.

450 tons, city hospital, Worcester, Mass., to Ingalls Iron Works Co., Verona, Pa.

415 tons, state bridge, NRS 780-B, Comal county, Texas, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

325 tons, farmers' sheds, Bronx market, Bronx, N. Y., to George A. Just Co., Brooklyn, N. Y.; Hillside Contracting Co., New York, general contractor.



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310 tons, St. Margaret's school, Middle village, Queens, N. Y., to Berkshire Structural Steel Co., Brooklyn, N. Y.; Chapman-Kruge Engineering Co., New York, general contractor.

300 tons, grandstand, dog track, East Boston, Mass., to Lehigh Structural Steel Co., Allentown, Pa.

295 tons, factory addition, East Walpole, Mass., to New England Structural Co., Everett, Mass.

285 tons, postoffice station "Y," East 70th street, New York, to Lehigh Structural Steel Co., Allentown, Pa.; Kenny Bros. Inc., New York, general contractor.

275 tons, warehouse for Levenson & Klein Co., Baltimore, to Dietrich Bros., Baltimore; reported in STEEL, April 29, as awarded to unstated fabricator.

270 tons, state bridge NRS-776D, Angelina-Trinity counties, Texas, to Austin Bros., Dallas, Tex.

250 tons, bridge, Macoupin county, Illinois, to Clinton Bridge Works, Clinton, Iowa.

220 tons, brew house for German Brewery Co., Cumberland, Md.

200 tons, station platform canopies, Pittsburgh & Lake Erie railroad station, south side, Pittsburgh, to Pittsburgh-Des Moines Steel Co., Neville Island, Pittsburgh.

180 tons, building, Springfield, O., for International Harvester Co., Chicago, to Berger Iron Works, Akron, O.

175 tons, building, John Deere Tractor Co., Waterloo, Iowa, to Gage Structural Steel Co., Chicago.

175 tons, Iowa, state bridges, to Pittsburgh-Des Moines Steel Co., Pittsburgh.

175 tons, Chevrolet Motor Co. building, St. Louis, to Mississippi Valley Stuctural Steel Co., Decatur, Ill.

150 tons, postoffice, Fort Scott, Kans., to Capitol Iron Works, Oklahoma City, Okla.

148 tons, Bird avenue subway for Southern Pacific Co., San Jose, Calif., to Columbia Steel Co., San Francisco.

138 tons, grade crossings, routes 23 and 6, Singac, Passaic county, New Jersey, to American Bridge Co., Pittsburgh; Linde-Griffith Construction Co., general contractor.

130 tons, plant building, Creighton, Pa., for Pittsburgh Plate Glass Co., to Pittsburgh Bridge & Iron Co., Rochester, Pa.

120 tons, state highway bridge 1057, Wayne county, Indiana, to Pan-American Bridge Co., New Castle, Ind.

115 tons, buildings, Bronx terminal markets, Bronx, N. Y., to George A. Just Co., Brooklyn, N. Y.; Turner Construction Co., New York, general contractor.

115 tons, project, Fairmount, N. Y., to unnamed fabricator.

110 tons, building, Crown Cork & Seal Co., Baltimore, to Ingalls Iron Works, Co., Birmingham.

110 tons, school, Wilson, N. Y., to Buffalo Structural Steel Corp., Buffalo.

100 tons, comprised of 50 for Hays school and 50 tons for South Hills school, both Pittsburgh, to Levinson Steel Co., Pittsburgh.

100 tons, state overpass, route 7, over Rutland railroad, Dorset, Vt., 60 tons of shapes to Vermont Structural Steel Co., Burlington, Vt., remainder bars to Albany Steel & Iron Supply Co., Albany, N. Y.; B. A. Barton Construction Co., Vergennes, Vt., general contractor.

Shape Contracts Pending

7000 tons, postoffice, St. Louis; bids of May 14 postponed to May 28.

1200 tons, fabricating piling for Seattle seawall project; bids in.

600 tons, municipal incinerator, North side, Pittsburgh; Hiler Engineering Co., subsidiary of Koppers Co., Pittsburgh, tentatively awarded contract on bid of $485,000.

500 tons, incinerator, Flushing, Queens, N. Y.

500 tons, gates, valves and trash racks, San Gabriel dam No. 1, Los Angeles; bids soon.

500 tons, slide gates, Tygarts river dam, Grafton, W. Va.; bids to Pittsburgh army engineers.

475 tons, state bridges, Texas.

250 tons, powerhouse, North Platte, Nebr.

250 tons, plant addition, Campbell Soup Co., Camden, N. J.; bids asked.

200 tons, postoffice, Chester, Pa.; bids asked.

200 tons, warehouse, Reading Co., Twentieth and Hamilton streets, Philadelphia; bids asked.

200 tons, Friends building, West Chester, Pa., early action indicated; was previously noted as pending.

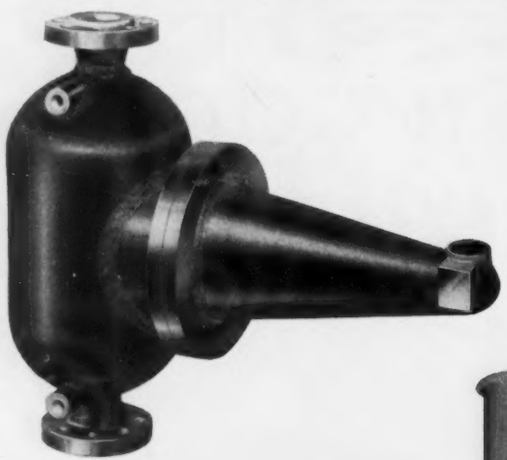
200 tons, indoor tennis court for Allegheny Country club, Sewickley, Pa.; bids May 8.

200 tons, building for Erie Corrugated Box Co., Erie, Pa.

170 tons, building for Marymount college, Tarrytown, N. Y.

170 tons, Mohicanville, O., dam, bids by Zanesville, O., army engineers, April 30.

150 tons, high school, Manhasset, Long Island.



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110 tons, school, Mexico, Me.
100 tons, including reinforcing, Kooskia public roads bridge, Idaho; S. G. Morin, Spokane, low.
100 tons, Girl's high school, San Francisco; bids rejected.
Unstated, concrete mixing plant, Bonneville, Oreg., project; George H. Buckler Co., Portland, Oreg., subcontractor.
Unstated, two 168-foot riveted truss spans; bids to United States engineer, Portland, Oreg., May 14.

Reinforcing

Reinforcing Bar Prices, Page 73

Philadelphia—Bids are to be opened May 6 on approximately 250 tons of bars for a textile factory at Allentown, Pa., for Ludlow Manufacturing Associates. Little else is pending in the immediate district, although considerable grade crossing elimination work is expected to begin to appear within a few weeks. The market on billet steel reinforcing bars, cut lengths, has been advanced 2 cents per 100 pounds, delivered, Philadelphia, to 2.36c, per pound. This results from the increase in Pennsylvania intrastate rates, May 6, to conform with the advance in interstate rates.

Pittsburgh—For the Great Lakes Steel Corp.'s continuous strip mill near Detroit it is reported that 18,000 concrete piles will be driven for the foundation, involving a large tonnage of reinforcing steel. Raymond Concrete Pile Co., New York, has the general contract. Attractive reinforcing bar inquiries continue to be issued by the Zanesville, O., army engineers' office for Muskingum, O., conservancy district work. New billet steel reinforcing bars hold at 2.05c, Pittsburgh, for cut lengths in carload lots.

Cleveland—Except for 1000 tons of reinforcing bars pending for the Cedar avenue federal housing project here, on which George A. Fuller Co., Washington, is low bidder, little work is being figured. This project also will require 300 tons of steel sash. Bids were opened May 3 on 550 tons of bars and 500 tons of piling for the Dover dam in the Muskingum, Ohio, conservancy district.

New York—An encouraging increase is noted in the volume of small orders which make up the bulk of tonnage here. Sellers await development of highway and bridge programs for an upturn in business.

Chicago—Concrete bars are less active in awards and inquiries, though shipments against old contracts gradually are increasing. Pending business generally is for small lots, but the outlook for heavier demand for public construction later this year is favorable. Quaker Oats Co. will build a grain elevator at Cedar Rapids, Iowa, involving 300 tons, while Armour & Co. packing plant here will take 900 tons.

San Francisco—The general contract for the Southern Pacific-Key System crossing of the San Francisco-Oakland bay bridge project in Oakland, Calif., requiring 3033 tons of bars and 2800 tons of shapes has been placed with Barrett & Hilp, San Francisco. Other bar business during the week was light.

Seattle — Local mills have a fair

Concrete Awards Compared

	Tons
Week ended May 4	1,017
Week ended April 27	1,712
Week ended April 20	20,495
This week in 1934	7,149
Weekly average, 1934	4,084
Weekly average, 1935	5,228
Weekly average, April	6,903
Total to date, 1934	93,750
Total to date, 1935	94,108

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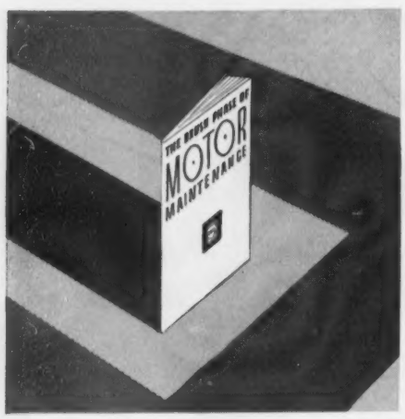

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amount of work in hand, prospects indicating improved business shortly. Alloway & Georg, general contractors for the Weyerhaeuser Timber Co.'s pulp mill at Everett, Wash., have placed the reinforcing order with the Pacific Coast Steel Corp., Seattle. The tonnage is indefinite but is expected to exceed 600 tons.

Reinforcing Steel Awards

600 tons, or more, Weyerhaeuser pulp mill, Everett, Wash., to Pacific Coast Steel Corp., Seattle; Alloway & Georg, Spokane, general contractors.

175 tons, 7148 feet, 72-inch sewer section, metropolitan district commission of Hartford, Conn., to Truscon Steel Co., Youngstown, O.; James J. Coughlan & Sons Inc., Boston, general contractor.

142 tons, state highway work in two counties in California, to unnamed interest.

100 tons, including shapes, five building projects in Alaska, to Pacific Coast Steel Corp. and Isaacson Iron Works, Seattle; Warrack Construction Co., Seattle, general contractor.

Reinforcing Steel Pending

3033 tons, Southern Pacific-Key System crossing, Oakland, Calif.; general contract to Barrett & Hilp, San Francisco.

1000 tons, Cedar avenue federal housing project, Cleveland; George A. Fuller Co., Washington, low bidder for general contract at $2,517,740.

900 tons, packing plant, Armour & Co., Chicago; previously reported as 400 tons. Bids close May 6.

300 tons, grain elevator, Cedar Rapids, Iowa, for Quaker Oats Co., Chicago.

250 tons, 7-story textile mill at Allentown, Pa., for Ludlow Manufacturing Associates, Boston; bids opened at Allentown, May 6.

105 tons, Girl's high school, San Francisco; bids rejected.

110 tons, Washington state college dormitory, Pullman; H. S. Wright & Co., Seattle, general contractor.

100 tons, including shapes and gates, Landsburg water system dam, Seattle; D. Nygren, Seattle, general contractor.

Unstated, gutters, curbs and miscellaneous concrete work, Bonneville, Oreg., project; Parker-Schram Co., Portland, Oreg., general contractor.

Pipe

Pipe Prices, Page 73

Pittsburgh—Bids were taken last week on 19,200 feet of various sized pipe by the Zanesville, O., engineers in connection with relocating gas lines at the Mohicanville, O., dam, belonging to East Ohio Gas Co., Cleveland. The material was understood to be largely 8-inch pipe. Following a wave of protest against the 415,000-ton 26 or 30-inch gas line from the Texas gas fields to St. Louis and Detroit, it is reported that intention to ask for bids has been indefinitely postponed. Most pipe producers consider the project, while of a substantial tonnage benefit, to be economically unfeasible. Improvement in demand for oil country goods, standard pipe and mechanical tubing, pushed specifications in April ahead of those in March, but several automobile concerns late last week issued holdups on some mechanical tubing business.

Chicago — Improvement in cast pipe demand still is gradual and is less than had been anticipated. Milwaukee is taking bids on 1300 tons of various sizes, while the Chicago sanitary district is in the market for 175 tons of fittings.

Boston—Cast pipe buying and inquiry is heavier. Price on 1390 tons, 20-inch, cement lined pipe for the metropolitan district commission, Boston, was $49.60 a ton, delivered. Fittings went at $100 a ton and flanged castings, $120. Several thousand tons recently have been bid or are pending in New England. Merchant steel pipe demand is steady but not heavy. Boston has closed on 450 tons of frames, covers, boxes, branches and curves for the water department, but has inquired for no pipe thus far this year.

New York—Inquiry for cast pipe is dull, and recently advanced prices as yet are untested.

Birmingham, Ala. — Official announcement that bids are being taken this month on several waterworks and sewage systems throughout the state on old programs, financial allotment having been made, gives encouragement to pipe producers.

San Francisco—Bids have just been opened on the largest municipal requirement of the year, 5150 tons for Los Angeles. United States Pipe & Foundry Co., American Cast Iron Pipe Co., and National Cast Iron Pipe Co., were low on 3700 tons, 750 tons and 700 tons, respectively. Oakland, Calif., has taken bids on close to 600 tons.

Seattle—Demand for cast iron pipe is lagging but greater distribution of federal funds is expected to aid municipalities which long have planned improvements. Portland, Oreg., opened bids April 29 for 15,000 feet of ¾ and 2-inch water pipe. Helena, Mont., is considering a $200,000 bond issue to finance a filtration plant.

Cast Pipe Placed

520 tons, 6 and 8-inch, Wolfeboro, N. H., to Central Foundry Co., New York.

200 tons, 6 and 8-inch, Campbellsport, Wis., to American Cast Iron Pipe Co., Birmingham, Ala.

189 tons, 4 to 8-inch, class 150, Ritchfield, Utah, to unnamed interest.

Cast Pipe Pending

5150 tons, Los Angeles; United States Pipe & Foundry Co., Burlington, N. J., low on 3700 tons, American Cast Iron Pipe Co., Birmingham, Ala., low on

750 tons, and National Cast Iron Pipe Co., Birmingham, Ala., low on 700 tons.
1300 tons, Milwaukee; bids May 9.
584 tons, 150 to 250 tons of class 150 or B, Oakland, Calif.; bids in.
330 tons, Dayton, Oreg., water system improvement; bids soon.
175 tons, special sizes, Chicago sanitary district; bids May 16.
140 tons, 12-inch and accessories, Spokane; bids in.
100 tons, 6 and 12-inch, Fall River, Mass.; bids in.

Strip Steel

Strip Prices, Page 73

Pittsburgh — Strip producers are carrying small backlogs into May, both because of certain Chevrolet holdups on shipments and also due to declines in the rate of miscellaneous buying volume. Base prices of 1.85c, Pittsburgh, on hot-rolled strip and 2.60c on cold-rolled strip are unchanged.

Cleveland—Strip mill operations have been reduced, owing to suspension of shipments to Chevrolet, Fisher Body and partsmakers. Apparently, orders have not been canceled, and some makers with Chevrolet bookings said last week their production had not been held up, although this is expected if labor difficulties are not settled this week. From other automotive sources specifications are in fair volume. Miscellaneous business is light.

Chicago—The declining tendency in strip steel demand is being retarded by fairly heavy requirements of miscellaneous users. Buying continues well diversified and though automotive needs still figure prominently, smaller users are providing a substantial share of the business.

Philadelphia — With Pennsylvania intrastate rates now increased include the new surcharge, the delivered prices here on hot and cold-rolled strip have been advanced 2 cents per 100 pounds. Narrow hot-rolled strip is now 2.16c, Philadelphia, and cold-rolled strip 2.31c. Business is spotty.

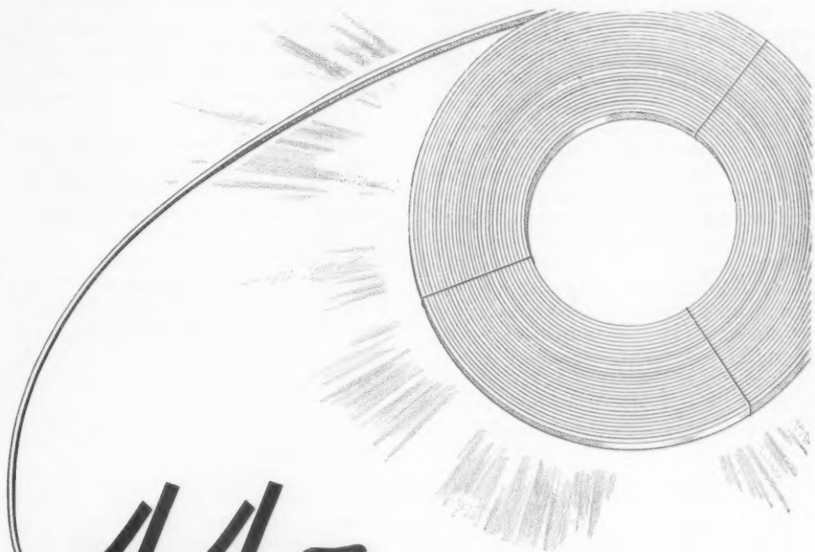
Wire

Wire Prices, Page 73

Cleveland—Resumption of operations at a leading screw manufacturing plant here after a strike has led to some tonnage for wire manufacturers, but on the other hand specifications from nut and bolt manufacturers have been reduced by holdups from Chevrolet plants. Wire production here has not been affected. Tonnage booked in April was 6 per cent less than in March, and 15 per cent under that of January, which month for most lines of finished steel was the best so far this year.

Chicago—Wire demand is fairly well sustained despite some recession from first quarter activity. Both specifications and production have declined moderately the past few weeks, though the outlook for fairly steady business for manufacturers' wire during May is regarded as favorable. The tendency in automotive requirements is downward slightly, though some miscellaneous consumers still are taking steady lots. Demand for merchant wire products continues spotty.

Pittsburgh — Automotive labor difficulties caused shipping suspensions on numerous lots of plain manufacturing wire and rods through last week, although miscellaneous buyers of wire products maintained specifications in unchanged volume. Led by fencing, rural wire product demand is fairly encouraging. The Pittsburgh carload base on nails remains $2.60 per keg, as does plain manufacturers' wire at 2.30c, base.



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Pig Iron

Pig Iron Prices, Page 74

Cleveland — Sales and shipments again declined moderately during the week. Sales were restricted to 2000 tons in small lots. Shipments in April in northern Ohio were slightly smaller than in March, but further west the gain was substantial, bringing the average for lake merchant furnace interests to about a 5 per cent increase for April.

May 13 has been set as the date for a hearing of the railroads' petition for an increase in Ohio intrastate freight increases before the public utilities commission at Columbus. This will be attended by a representative of the interstate commerce commission. It is to determine whether the failure of the state commission to order an advance tends to conflict seriously with the federal commission's interstate order, as railroads contend. The federal commission has authority to order an intrastate advance within 24 hours. Costs of assembling raw materials at blast furnaces are up equivalent to 50 cents a ton of pig iron at Cleveland, 80 cents a ton at Youngstown. Some producers say they will file higher prices for third quarter May 21.

Pittsburgh—The design of 17 earthen dams in the Muskingum, O., district is being made to include cast steel conduits. Specifications covering these conduits are being drawn by the Zanesville, O., army engineers and steel casting makers will have several thousand tons of prospective business in this connection. Foundry pig iron continues to move in good volume here, on the basis of $18.50 a ton, Pittsburgh district furnace.

Chicago—Pig iron shipments are steady and although the outlook for this month is somewhat uncertain, deliveries are expected to compare favorably with those of April, which were about 20 per cent ahead of March. Foundry schedules in the automotive industry so far have not been disturbed in this district by labor troubles elsewhere, and farm implement manufacturers also continue to operate steadily. Pig iron price advances next quarter still are in the conversational stage with the market continuing through this period at $18.50, furnace, for No. 2 foundry and malleable.

Boston—Pig iron buying continues listless and in small lots with the situation as to foundry melt unchanged. On iron shipped into this territory by rail the freight surcharge applies and about 20 cents per gross ton is the maximum increase on delivered prices. During April, 351 tons, all Indian iron, was imported in the Boston customs district.

New York—While railroads have approved a schedule for the simplification of computing the recent increases in carlot freight rates on finished iron and steel, no such schedule has been devised to simplify calculations on pig iron, semifinished steel and other materials sold on a gross ton basis. Consequently, pig iron sellers will continue to figure delivered prices to as many decimals as are necessary. Sellers look for a slight improvement in tonnage this month, as the foundry melt appears to be expanding a little.

Philadelphia—Despite the slight downward trend in steelmaking operations, leading pig iron producers here expect a small gain in the foundry melt this month, resulting in a generally better movement in pig iron. Shipments in this district in April were a shade better than in March. One seller reports an increase of about 3 per cent. With the increase in freight rate surcharges on Pennsylvania intrastate traffic effective May 6, the delivered price on No. 2 foundry iron here has been increased 5.32 cents to $20.3132, as against $20.26 previously; malleable now is $20.8132 and basic $19.8132.

Buffalo—The pig iron market continues quiet with shipments slow during the past three weeks. The recent inflated movement resulting from freight rate increases will continue to reduce shipments to consumers for several weeks it is believed. Six blast furnaces continue in operation in spite of reduced sale and open-hearth melt.

Cincinnati—Specifications for pig iron against contract are down sharply, reflecting a more cautious sentiment rather than a change in the melt. Steady shipments during March and April provided considerable iron inventory for some melters.

St. Louis—Despite noticeable slowing down in shipments during the final week of April, total movement for the month was measurably ahead of March. While the April volume doubtless was boosted to some extent by anticipation of the advance in freight, it largely represented iron actually needed and consumed. As a whole, the melt is well sustained.

Birmingham, Ala.—While pending federal developments will require large quantities of products involving cast iron, the pig iron market for the time being is slow. Nine blast furnaces are in operation, four on foundry iron, four on basic and one on recarburizing iron. Surplus stock on furnace yards is still heavy.

Toronto, Ont.—No special improvement was noted in the pig iron market during the week. Melters are placing orders at regular intervals and with indications of further advance in the daily melt. Production is sustained, with three stacks blowing and output of about 1200 tons per day.

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Quicksilver

New York—Quicksilver is unchanged, although there are rumors of possible price weakness. Lots of 100 virgin flasks of 76 pounds each are $72.50, a flask, with single flasks $75.

Scrap

Scrap Prices, Page 75

Pittsburgh—No. 1 heavy melting steel remains at $11.25 to $11.75, machine shop turnings, $7.75 to $8.25, and hydraulic compressed sheets, $10.75 to $11.25. All of these prices and railroad specialty scrap at $14.00 to $14.50 are based on sales now of some standing. Following sale by the Pennsylvania railroad May 1 of 5300 tons of heavy melting steel, the Baltimore & Ohio railroad takes bids May 6 on 2500 tons of No. 1 steel and other items.

Cleveland—Steel and iron scrap here continues dull, with a few shipments into the Youngstown district but little moving to local melters. Holders of scrap are slow to part with their holdings at present prices.

Chicago—Scrap is more plentiful and prices no longer are strengthening in the dealers' market. Mills are not disposed to pay more than $10 for No. 1 heavy melting steel, in contrast to substantially higher prices which have been paid by sellers in covering contracts. Completion of shipments against these is expected to result in lowering of bids to mills by brokers. Quotations on other grades are unchanged with some continuing nominal.

Boston—Export demand for scrap has increased substantially with purchases for Poland and Italy. For No. 1 steel scrap dealers still pay $8.50, dock, and $7.50 for No. 2. Prices are generally steadier. Turnings show strength and some shipments have moved to the Pittsburgh district, shipper paying $1.50 to $1.75, f.o.b. The Worcester, Mass., consumer is not buying heavily or attempting to meet the export price for heavy melting steel.

New York—Prices of steel and iron scrap are steadier with further strength shown in turnings, which are up 25 cents per ton and heavy breakable cast. Buying for boat loading is slightly more active at firm but unchanged prices. Domestic activity is small with some shipments of heavy breakable cast and No. 2 heavy melting steel to Eastern Pennsylvania.

Philadelphia—Purchase of 5000 tons of No. 1 steel scrap by the leading Claymont, Del., consumer at $10.50, delivered, has resulted in an increase in the general market of 50 cents a ton, the current spread now being $10 to $10.50. This follows buying by this consumer about a fortnight ago of upwards of 2000 tons at $10. Heavy breakable cast is strong and has been advanced on a small purchase to $10 to $10.50, delivered. All other grades are unchanged. This month is expected to see a good movement of scrap from this port for Italy and Japan, as boats are now more easily available and the exchange situation in Italy which has precluded shipments to that country for several weeks, has apparently now been adjusted.

Buffalo—Stronger markets are in evidence. No. 1 steel can be sold locally at $10 and No. 2 at $8.50. Dealers will equal consumers in purchasing both materials, it is understood. Turnings and borings have regained part of their recent declines while cast and malleable also are stronger locally on the basis of better offers in other districts. Steel rails have sold at prices representing increases over former transactions.

Detroit — Chevrolet last week sharply reduced its offerings of scrap, due to the effect of the Toledo strike handicapping its assemblies. However, the volume of automobile scrap generally is so heavy that there has yet been no effect upon prices. All prices are unchanged this week, but there is an increasing feeling that any change would be upward. Large consumers continue aloof from the market or are bearish on prices.

Cincinnati—The iron and steel scrap market remains quiet, dealers refusing to accede to mill pressure for lower prices. Heavy melting steel is quotable at a maximum of $8 on odd lot purchases.

St. Louis—The market has firmed slightly, due mainly to scant offerings and betterment at eastern centers. The recent purchase of a round tonnage by an east side mill had a tendency to stiffen grades applicable on this order. Cast iron borings and machine shop turnings were weak and fractionally lower.

Seattle — Exporters are marking time as they are still unable to meet prices offered to Japan by Atlantic coast shippers. Additional deep sea tonnage has been sold to Japanese interests for scrapping, practically clearing the North Pacific market of obsolete vessels.

Toronto, Ont. — Trading in iron and steel scrap is increasing. Mills in the Hamilton district are taking scrap in larger tonnages. Montreal dealers report improvement in steel grades. Iron scrap has a steady call from foundries.

Ferroalloys

Ferroalloy Prices, Page 74

New York—With the Pennsylvania intrastate rates increased, effective May 6, to include the new surcharges, the logical basing point for

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Pittsburgh consumers of ferromanganese changes from Philadelphia back to Baltimore, which now has the lowest rate, $5.1253. With the base price unchanged at $85, duty paid, at Atlantic and Gulf ports, this makes the delivered, Pittsburgh, price $90.13. Shipments are moving more slowly, as steelmaking operations decline. Domestic spiegeleisen, 19 to 21 per cent, is holding at $26, Palmerton, Pa., on lots up to 50 tons, and $24, on 50 tons and over.

Warehouse

Warehouse Prices, Page 6

Pittsburgh—Jobbers are quoting 3.20c for cold-drawn bars both for city and rural shipment, thus abolishing the former differential of 10 cents per 100 pounds off the city price for out-of-town shipment. Other warehouse prices are unchanged. Warehouse steel demand is falling off.

Cleveland — Warehouse tonnage in April was on a parity with that in March, with a slowing tendency in number of orders in the last ten days. May generally is a lighter month than either March or April. Unsettled labor conditions have cut in heavily on warehouse business.

Chicago — April warehouse sales showed only a slight change from that of March. The last 10 days represented a peak. Prices are unchanged.

Boston — Slight advances have been made on major products by warehouses in this district. Volume with most jobbers last month was above that of March with buying well distributed.

New York—Warehouse sales are maintained at the volume of last month. Buying is well distributed in small shipments though a few large orders have been taken. Prices are firm and unchanged.

Philadelphia—Jobbing demand appears steady, with little variation in prospect. Most jobbers report April bookings as about equal to March. Prices are unchanged.

Detroit—A little demand for iron and steel out of warehouse is emanating from tool and die shops doing preliminary work on 1936 models. The volume of warehouse business continues unchanged, and is seasonally good. Prices are steady.

Cincinnati—April volume for steel jobbers was about on a par with March and so far this month shows no marked trend. Most tonnage is for a broad industrial demand.

Seattle — With seasonal activity developing, wholesale houses are selling increased tonnages to the agricultural districts. Contractors for public works are placing orders and the turnover is maintaining a steady and satisfactory level.

Tin Plate

Tin Plate Prices, Page 72

Pittsburgh—A 10-point decline in the average of tin plate production last week placed the industry's rate of operations about 75 per cent. This was caused by a leading interest's curtailment, plus a shutdown by a local independent for a week's repairs. Tin plate producers appear to have on the average about two weeks' backlogs of orders despite the fact canmakers still are consuming plate in record volume. The market holds $5.25, Pittsburgh, per base box, with No. 24 unassorted long ternes quoted 3.40c.

Iron Ore

Iron Ore Prices, Page 75

Cleveland — Vessel shipments of Lake Superior iron ore in April totaled 400,062 tons, the movement in the last few days of the month proving heavier than expected. Last year no shipments were made in April, although considerable ore was moved in the month in 1933 and 1932. Some consumers' mixtures have been low and out of balance, and advantage was taken of the fact the lakes were open. The tonnage is significant, but not an indication of a proportionate increase for the season. Pittsburgh Steamship Co., United States Steel Corp. subsidiary, has ten boats in commission, and is preparing to operate 45 this year, its fleet numbering 86. Some independent iron ore vessels are using their deck space for shipping automobiles. Vessel rates have been reaffirmed.

The Ford Motor Co. last week closed on its inquiry for 180,000 tons of iron ore with three producers.

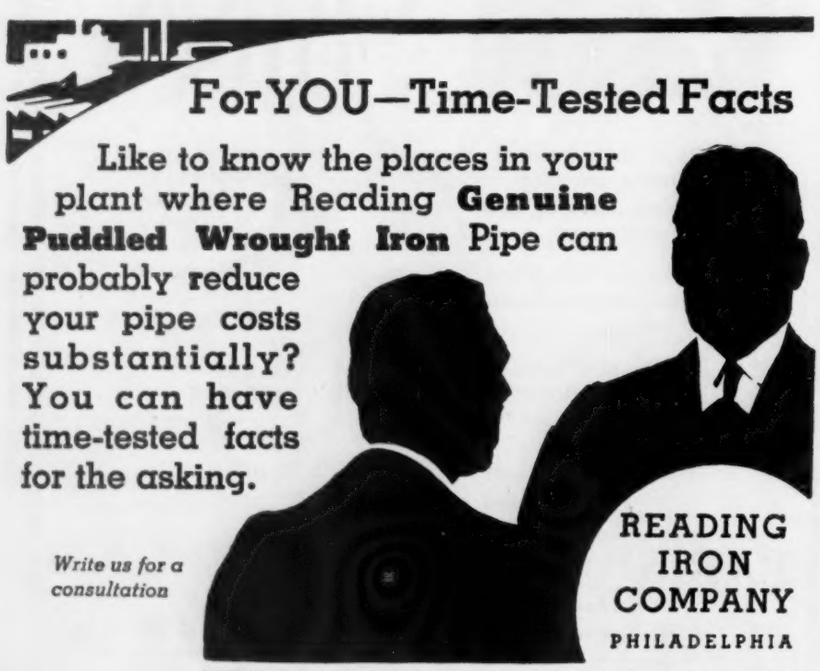
Metallurgical Coke

Coke Prices, Page 73

Beehive metallurgical coke continues to show a disorganized market from the standpoint of demand and prices. Not only is consumer demand low but price shading is still reported in standard furnace coke. Nominally, beehive furnace coke is $3.60 per ton, Connellsville, Pa., oven basis. Adequate stocks preclude foundries from testing the $4.60 per ton market on common foundry grades and $5.10, same basis, for premium grades.

An increase of 3 cents in the Philadelphia delivered price on by-product coke became effective May 6, when Pennsylvania intrastate rates took the new schedules applying on interstate rates since around the middle of last month. The new delivered Philadelphia price is $9.03. Movement of foundry grades is expanding slightly, although little real variation has been noted in some time.

Consumption of foundry coke is holding well at Chicago with pros-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pects for increased shipments in May. Prices have been extended unchanged for May, at $8.50, ovens, for outside delivery and $9.25, delivered Chicago.

Steel in Europe

Foreign Steel Prices, Page 6

London—(*By Radio*)—The Anglo steel entente has been formed with a three months agreement, on the basis of an annual 643,000-ton continental import quota into Great Britain at 33 1/3 per cent import duties.

Middlesbrough pig iron shipments are normal, largely for domestic consumption. Steelworks are busy, especially in structurals. Rails are being shipped to Canada and plates to Russia. Exports of galvanized sheets and tin plate are light.

The Continent reports export trade is improving, the Belgian domestic market gaining activity, and German trade satisfactory. French and Dutch blast furnaces have agreed on their respective market quotas.

Nonferrous Metals

Nonferrous Metal Prices, Page 74

New York—Activity in the copper market improved markedly after mid-week when it became evident that the code for the industry would likely be extended for another year. All metals held steady and mostly quiet, continued fair demand for lead being the exception.

Copper—Sales jumped to 2601 tons Thursday following light business which averaged 1000 tons during the preceding five market days. Allocated sales for April dropped sharply to only 26,600 tons from 32,302 in March. This compared with 29,456 tons allocated in the next preceding month. In addition to the uncertainties pertaining to the code extension, a recession in certain copper mill product business was an important factor causing the decline. Electrolytic held unchanged at 9.00c, Connecticut, while export copper moved up to 7.75c, c.i.f. European ports.

Zinc—Demand was spotty and light but the market tone was steady. Prime western held unchanged at 4.10c, East St. Louis. Sellers view the immediate future with confidence and expect favorable statistics for April.

Lead—Demand held up remarkably well in view of recent heavy business. One leading seller limited its sales or withdrew from the market after early morning bookings on practically every day of the week. Refined stocks were probably cut during April with shipments estimated at over 40,000 tons, or the largest monthly business with one exception since 1931. Prices were firm on the basis of 3.75c, New York, with St. Joseph lead asking $1 premium in that market.

Tin—Consumer business was light but prices held fractionally above 50.00c for prompt deliver. Ninety-nine per cent tin supplies continued tight. World visible supply was reported cut 2802 tons. Much attention was accorded the McReynolds tin bill in Washington designed to foster domestic tin mining and smelting.

Antimony—Price weakened in a dull market. Chinese spot held nominally at 14.25c, duty paid, with futures dropping to 10.75c, c.i.f. in bond.

Activities of Steel Users and Makers

HARNISCHFEGER CORP., Milwaukee, has broken ground for a new plant hospital and first aid station as a memorial to the late Arthur G. Henricks, formerly vice president and general manager, inventor in the electric crane and hoist field. Ground was broken ceremonially, using a new ⅜-yard shovel recently developed by this company, weighing 15,800 pounds.

◆ ◆ ◆

Pressure Castings Inc., Cleveland, has booked an order for a million castings, for delivery within 90 days.

◆ ◆ ◆

Lukens Steel Co., Coatesville, Pa., has moved its New York office to room 2714 Chrysler building, 405 Lexington avenue.

◆ ◆ ◆

Superior Steel Corp., Pittsburgh, has opened an office at 4305 Chrysler building, New York. W. M. Coles of Philadelphia, is in charge.

◆ ◆ ◆

Amerlux Steel Products Corp., New York, has moved its offices to room 720 in the Lincoln building, 60 East Forty-second street.

◆ ◆ ◆

Thomas S. Gassner Co. Inc., Wayne avenue and Apsley street, Philadelphia, manufacturer of alloy metal products, including stainless steel, aluminum, brass, nichrome, monel metal, steel and iron, has taken over manufacture and sales of products of the H. D. Dougherty Co., Philadelphia, manufacturer of hospital equipment, modernistic furniture and similar products.

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Republic-Corrigan Merger Is Upheld

(*Concluded from Page* 15)

protect the consumer so that he can purchase his commodities at competitive prices. No purpose to forbid all mergers appears.

Courts may take cognizance of the fact that the agencies of the government charged with enforcement of the Clayton law have during the twenty years since it became effective apparently applied no different construction. Official and semi-official reports reflect that which is likewise a matter of common knowledge, viz., that during the time the Clayton act has been in force combinations, mergers and consolidations have been consummated to a far greater extent than ever before, and frequently in the manner contemplated by the agreement here under consideration. . . .

It is certain that the anti-trust laws have failed to restrict the merger movement. Concentration of industry is no longer a future consideration as it was largely in 1890 when the Sherman Act became a law and to a considerable extent in 1914 when the Clayton act was made effective. It has become an accomplished fact.

Saves Unnecessary Expense

The result of combinations and mergers may be and not uncommonly is to save overhead, increase mass production, reduce prices, and improve the product. Where these beneficial results are used fairly and are passed on to the consuming public and to employes, it cannot be considered that they are within the prohibitions of section 7.

The elimination in such cases of the competition between the merging corporations is, in reality, a step in the strengthening of competition between the units vitalized thereby and the general industry. Therefore, instead of probability of injury to the public resulting from consummation of such merger, the interest of the public will be enhanced.

The foregoing observations warrant the conclusion that in proceedings under these provisions of section 7 of the Clayton act here relied on, the burden rests on petitioner to prove that the effect of the stock acquisitions will probably be injurious to the public, and that it is not sufficient merely to show lessening of competition. This conclusion results from the consideration of the fundamental purposes of the statute, its construction by the courts, its contemporaneous interpretation by the agencies charged with its enforcement, and its legislative history importing weight to the inclusion of the word "substantial." It also gives weight to the competitive situation existing in the industry, as well as to changing economic conditions, and recognizes that determination of the issue of injury to the public may vary with these elements.

The record is devoid of proof that consummation of the merger contract would be in any sense inimical to the interests of the public.

Competition Made Keener

While the evidence justifies the conclusion that competition is to some degree eliminated as to certain products, that competition may with propriety be designated as deminimis when compared with the competition in the industry as a whole, and as being insufficient to affect the public interest when considered in its relation to the total sales in the competitive areas included within the several states where the business of the merging companies is chiefly conducted.

There is no evidence that the contemplated merger was entered upon with the purpose of lessening competition or of exercising control over competitive conditions in the steel industry. The practical impossibility of that accomplishment is so definitely disclosed that no such aim can fairly be implied.

Attempted control of competition in an industry where overproduction has for several years been clearly apparent and in which intense competition has eliminated many of the weaker units to the extent that two now control over fifty-two per cent of the capacity of the industry and nine control over eighty per cent thereof would be futile.

The capacity of the industry to produce is greatly in excess of present or even normal demands in every important iron and steel product. In the year 1929, the industry operated at only 89 per cent of capacity and since that time has at no time operated in excess of 40 per cent of capacity. Competition in the steel industry generally will be enhanced rather than lessened as the result of the merger.

No Ulterior Motives

There is nothing from which it may be found that the purpose of the merger is to increase the price of any iron or steel product, to create a monopoly, to achieve a mere increase in size, or to ultimately bring about further mergers.

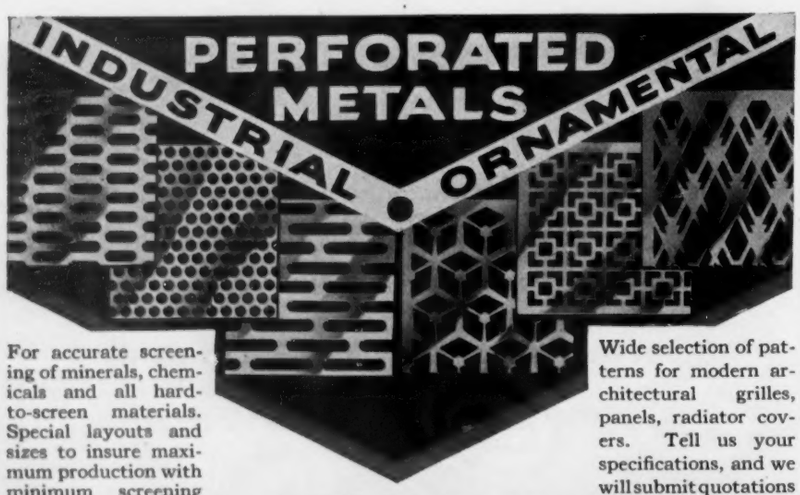
The apparent purpose on the part of Republic is to acquire additional and needed supplies of iron ore and coal and additional facilities supplementing its own, for the manufacture of pig iron and semi-finished steel, and to bring about a reduction in costs in manufacture and distribution.

Corrigan's purpose is to unite its stockholders with a corporation having an excess of finishing facilities, thereby obviating necessity for further capital expenditures in construction or acquisition of finishing plants. The net result will be better balanced facilities making possible manufacture at lowered costs.

Denial of the relief prayed is compelled by petitioner's failure to prove sufficiently substantial lessening of competition to warrant a finding of probable injury to the public as a result of consummation of the merger. The evidence drawn from the wording of the statute, combined with the judicial, administrative and practical interpretation thereof, necessitates the result reached in this case.

The foregoing opinion is adopted by the court as its findings of fact and conclusions of law and is hereby made a part of the record.

A decree of dismissal, in conformity with the foregoing opinion, may be submitted for signature.



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Equipment

Cleveland — Automobile labor troubles, with their attendant shutdowns here and in Toledo have had effect upon suppliers of machinery and equipment. One dealer here has sold a number of used gear cutters, understood to be for installation at the Warner Gear plant of General Motors at Muncie, Ind. Opinion is divided as to whether these purchases are simply a threat of the corporation to transfer operations from Toledo to Muncie, or a true indication the move will be made.

Erie Foundry Co., Erie, Pa., is building three large steam forging hammers for shipment to China.

Pittsburgh — Koppers Construction Co. here has received order from Ford Motor Co. for installation of two 61-oven by-product coke batteries to be built at Ford's Dearborn,

Mich., plant. The order is valued at about $3,250,000, and is reported to be the largest coke oven order placed in the United States in over seven years. Completion is expected within a year. Last week, after the above contract was signed and announced, it was reliably reported negotiations were under way for an additional coke oven contract for Ford which would roughly double the above order. Award of cold rolling equipment for American Sheet & Tin Plate Co.'s Gary, Ind., continuous mill is delaying confirmation of details on contracts covering the hot mill. United Engineering & Foundry Co., Pittsburgh, and Continental Roll & Steel Foundry Co., Chicago, have shared in the contracts for the hot mill.

Steel Industries Engineering Corp., Pittsburgh, has recently received orders for two electric rotary clay guns through their representative, Ashmore Benson & Pease Ltd., Stockton-on-Tees, England. These guns are for Appleby-Frodingham Steel Co. Ltd. and Messrs. J. Lysaght Ltd., both of England.

Chicago—Improvement and extension work at steel plants still is confined largely to installation of new rolling equipment and improvements to existing mills. While ordinary repairs are being made regularly to open-hearth furnaces and other steelmaking equipment, no extensive alterations or enlargements are being carried out. Purchase of small types of machinery, including machine tools, are light. Machine tool demand elsewhere continues slow though April sales were slightly heavier than those of March. Inquiries, however, continue rather encouraging and sellers anticipate improved business upon the appearance of a more favorable outlook in general conditions. Foundry equipment sales are in fair volume, though the rapid improvement of previous months is lacking.

Seattle—The market has assumed a broader aspect, largely due to public works projects but industrial buying showing more activity. United States engineer, Portland, Oreg., will receive bids May 24 for two 43,200-kilowatt alternating current generators and auxiliaries for the Bonneville dam power house, estimated in excess of $1,000,000. Idaho Power Co. plans immediate installation of a $1,000,000 hydroelectric plant on the Snake river. Columbia Contracting Co. has purchased concrete mixing equipment for the Bonneville job. Multnomah county, Oregon, will open bids May 8 for a rock crushing plant. Interior department, Seattle, is receiving bids for a large list of miscellaneous items for the Matanuska, Alaska, colony project including stoves, harvesting equipment, a complete sawmill, threshing outfit and farm tools.

Construction and Enterprise

New York

NEW YORK—Department of docks, pier A, North river, has been authorized by the board of estimate, Municipal building, to spend $628,000 for mechanical equipment for pier 88, North river, including conveying, elevating and other mechanical handling equipment and power apparatus.

NEW YORK—Washburn Wire Co. will start work in about 60 days on an addition to its plant at 118th street and East river, to replace a building to be torn down to provide space for a municipal improvement. An 18 x 100-foot site has been purchased adjoining the present property for the new construction, definite plans for which have not as yet been completed.

PORT JERVIS, N. Y.—Municipality is making a preliminary survey for electric power and light plant to cost over $50,000. L. T. Klauder, Lincoln-Liberty building, Philadelphia, architect.

SYRACUSE, N. Y.—General Ice Cream Co., 120 Broadway, New York, will start work shortly on a $100,000 plant addition at its division here. The new plant will be two stories high, 115 feet square.

Massachusetts

CAMBRIDGE, MASS.—Court Radiator Co., 336 Massachusetts avenue, recently sustained damages by fire.

CHELSEA, MASS. — Commonwealth of Massachusetts, trustees of soldiers home, W. J. Keville president, State house, Boston, plans building a power house to cost in excess of $100,000. Application to PWA for funds will be made.

LOWELL, MASS.—City, J. J. Bruin mayor, City hall, plans erection of municipal electric light plant.

Vermont

HARTFORD, VT.—Town, A. E. Watson, chairman of committee in charge, Town hall, plans electric light plant and waterworks system.

PUTNEY, VT.—Town, board of selectmen, town hall, plans erection of electric light plant.

New Jersey

CEDAR GROVE, N. J.—Essex Co. is planning to modernize and enlarge the power plant at the city hospital at a cost of $125,000. R. Carey, 333 Fulton street, Newark, N. J., engineer.

Pennsylvania

MEADVILLE, PA.—City, G. S. Maxwell, clerk, plans municipal light and power plant, cost of which will exceed $105,000. R. L. Phillips, city engineer.

PHILADELPHIA — Commanding officer, Q. M. depot, Twenty-first and Johnston streets, will take bids May 15, circular 338, on one centrifugal pump, complete with motor and accessories.

Ohio

BEREA, O.—City is planning to make application to PWA for grant to finance construction of municipal light plant, costing about $130,000. W. Root, Bagley road, city engineer.

BELLEFONTAINE, O.—All machinery and equipment, tools, etc., of the Bellefontaine Bridge & Steel Co. will be sold at auction May 14. Industrial Plants Corp., Huntington Bank building, Columbus, O., is conducting the auction.

CINCINNATI — Carthage Distilling

KARDONG CIRCLE BENDER

● This machine is built powerful and fast for heavy duty fabrication in both plant and field where large tonnage is required.

It will handle 20 tons or more per day and will bend bars 1¼ in size. Several bars can be bent in one operation depending on the size of bars. Circles or radius of any size required in reinforcing work from 18" up can be bent. Bars with different radius can be bent in one operation without stopping machine.

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346 Buchanan Street, N. E. Minneapolis, Minn.

Corp., 7818 Anthony Wayne avenue, plans installation of power equipment, conveying and other mechanical handling equipment in its new plant units, comprising a 3 and 5-story rectifying plant and 7-story storage and distributing unit. Cost is estimated at over $350,000.

DAYTON, O.—Office of contracting officer, material division, air corps, Wright field, will take bids May 9, circular 693, on 54 motor generators.

READING, O.—Wire Fabricating Machine Co. has been incorporated by Herman A. Bayless, James G. Kyle and Fred C. Rosche. Waite, Schendel & Bayless, Union Central Life building, Cincinnati.

ST. MARY'S, O.—Auglaize Box Board Co., manufacturer of paper board products, is considering extensions and improvements to the steam power house at its mill, including installation of new boiler and auxiliary equipment.

SYLVANIA, O.—City, H. C. Quinnell mayor, is considering construction of electric light plant. Cost is estimated at $150,000. G. Champe, municipal engineer.

Michigan

BATTLE CREEK, MICH.—G. O. Lewis, Battle Creek, has the contract for the constuction of a factory building, 45 x 120 feet, to be erected here for the Battle Creek Box Co.

DETROIT—Oldberg Mfg. Co., 2667 East Grand boulevard, has awarded contract for a $17,000 factory addition.

DETROIT—Superior Tool Works, 6633 Rohns street, has awarded contract for a factory addition, 30 x 111 feet.

DETROIT—Aluminum Co. of America, 3311 Dunn road, is planning to erect a 1-story addition to its plant, 35 x 312 feet.

DETROIT—Proctor-Keefe Body Co., 7741 Dix avenue, will build a 60 x 80-foot factory addition.

DETROIT—General Motors Parts Corp., General Motors building, of which M. D. Douglas is president, is contemplating enlarging its parts depots in various sections of the country.

DETROIT—General Motors Corp., General Motors building, is considering an expansion program at the Pontiac Motor Co. and Fisher Body Corp. plants in Pontiac, Mich., possibly expending $2,500,000.

DETROIT—Public lighting commission is planning to re-submit application to PWA for loan of $1,500,000 for a power line extension project, comprising erection of three new sub-stations.

EDMORE, MICH.—Village is contemplating the construction of a sewage system, to cost about $20,000. Hamilton & Weever, Grand Rapids, Mich., engineers, are preparing the plans.

JACKSON, MICH.—Turnmil Corp. has been incorporated by G. W. Blackinton, C. B. DeVlieg, C. Z. Potter and Leland Bisbee, to manufacture a machine designed to reduce forgings to a size suitable for finished grinding. The company has leased 14,000 square feet of manufacturing space in a plant on Wildwood avenue, which it will recondition.

NORTHVILLE, MICH.—Ford Motor Co., Dearborn, Mich., is contemplating erection of a plant here for the manufacture of valves, although nothing is definite as yet. The project is in line with Ford's plans for the development of factories in that area.

PORT HURON, MICH.—Lakeside Brewing Co. will make alterations to its brewing plant.

Illinois

CENTRALIA, ILL.—City clerk, is making plans for erection of power plant, including generating equipment, switchboard, auxiliaries and accessories. Cost is estimated at $477,000.

CHICAGO—Clinton Products Co., 1217 West Washington boulevard, has been incorporated by Nathan Siegal, Allen Siegal and Fannie Siegal, to manufacture electrical products. Correspondent: William C. Greatman, 11 South LaSalle street.

CHICAGO—Dunn & Hayward Inc., 221 North LaSalle street, has been incorporated to manufacture equipment and machinery for lighting, heating and cooling, by R. Garth Dunn, Harold S. Hayward Jr. and Olivia G. Dunn. Correspondent: George F. Mulligan, 33 North LaSalle street.

Indiana

INDIANAPOLIS—Validity Specialty Mfg. Co. Inc., 1190 Kentucky avenue, has been formed to manufacture tools, machines and automobile accessories, by George W. Heller, Max W. Martin and Roy L. Thompson.

INDIANAPOLIS — Mid-West Steel Railway Tie Co. Inc., 511 Indiana Trust building, has been formed to manufacture steel railway ties, by Oscar L. Chamness, Troy I. Philpot, Robert D. Alfonte and Wilden A. Driver, the latter also being named resident agent.

SOUTH WHITLEY, IND.—Local factory of the Grip Nut Co. will soon be put in operation, after being idle for three years, and will install equipment for the manufacture of brakeshoes for railroad cars. John Sharpe is executive in charge.

Oklahoma

TULSA, OKLA.—City, Cyrus S. Avery, chairman special chamber of commerce committee, plans installing hydroelectric power plant on Lake Spavinaw, utilizing flow of water from upper dam to lower dam for power generating.

Texas

THREE RIVERS, TEX.—City, J. K. Montgomery mayor, receives bids May 10 for waterworks improvements, including water softening and pump house.

SAN ANGELO, TEX.—City votes May 14 on issuing $900,000 revenue bonds for constructing power plant.

HARLINGEN, TEX.—Ralph Fair and associates, Houston, Tex., are planning to expend $350,000 for constructing crude oil cracking plant here. Work will begin soon.

Minnesota

ALBERT LEA, MINN.—Wilson & Co., manufacturer of commercial fertilizers, plans installation of electric power equipment in new 1, 2 and 3-story plant addition. Cost is estimated at $85,000. Company proposes further plant expansion in near future to cost in excess of $250,000. (Noted March 18).

Iowa

FAIRFIELD, IOWA — Municipality has voted $100,000 for constructing electric light and power plant and distribution lines.

MANNING, IOWA—Municipality is making a survey for erection of electric light and power plant. Cost is estimated at over $40,000. Maturity is indefinite.

Missouri

KANSAS CITY, MO.—S. E. Massengill Co., 208 West Nineteenth street, plans installation of electric power equipment in new 1-story addition to chemical plant. Entire project will cost about $40,000.

KANSAS CITY, MO.—City, H. F. McElroy city manager, is starting work

(*Please turn to page* 96)

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President

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Vice Pres.

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Ferro Chrome	English	The American
Ferro Silicon	French	Swedo Iron Co.'s
Calcium Silicide		
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Manganese Ore	Iron Ores	Chrome Ore
Open Hearth Use		Lump
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Norton Co., Worcester, Mass.

ACCUMULATORS
Morgan Engineering Co., The, Alliance, O.

ACETYLENE
Air Reduction Sales Co., 60 East 42nd St., New York City.
Linde Air Products Co., 30 E. 42nd St., New York City.

ACID-PROOF LININGS
Ceilcote Co., The, Rockefeller Bldg., Cleveland, O.

ACIDS (Pickling)
American Chemical Paint Co., Ambler, Pa.

AIR COMPRESSORS—See COMPRESSORS (Air)

ALLOYS—See FERROALLOYS

ANGLES, CHANNELS—See BEAMS, CHANNELS, ANGLES

ANGLE IRON BENDERS
Excelsior Tool & Machine Co., Ridge and Jefferson Aves., East St. Louis, Ill.

ANNEALING BOXES
Union Steel Casting Co. 62nd & Butler Sts., Pittsburgh, Pa.

ANODES (All Types)
The Udylite Co., 1615 E. Grand Blvd., Detroit, Mich.

AXLES
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Republic Steel Corp., Youngstown, O.
Standard Steel Works Co., Burnham, Pa.
Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.

BABBITT METAL
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

BANDS—See HOOPS AND BANDS

BANDS (Iron and Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
The Stanley Works, New Britain, Conn. Bridgeport, Conn.

BAR BENDERS
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.

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Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
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Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
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BARS (Iron)—See IRON (Bar)

BARS (Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Laclede Steel Co., Arcade Bldg., St. Louis, Mo.
Midvale Co., The, Nicetown, Philadelphia, Pa.
Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
The Stanley Works, New Britain, Conn. Bridgeport, Conn.
Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.
Timken Roller Bearing Co., The, Canton, O.
Weirton Steel Co., Weirton, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

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Bethlehem Steel Co., Bethlehem, Pa.
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Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Weirton Steel Co., Weirton, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

BEARINGS (Ball)
Bantam Ball Bearing Co., The, South Bend, Ind.
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New Departure Mfg. Co., Bristol, Conn.
S K F Industries, Inc., Front St. & Erie Ave., Philadelphia, Pa.

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Cramp Brass & Iron Foundries Co., Paschall Sta., Philadelphia, Pa.
Shenango-Penn Mold Co., Dover, O.

BEARINGS (Journal)
Bantam Ball Bearing Co., The, South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Hyatt Roller Bearing Co., P. O. Box 476, Newark, N. J.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
S K F Industries, Inc., Front St. & Erie Ave., Philadelphia, Pa.
Timken Roller Bearing Co., The, Canton, O.

BEARINGS (Quill)
Bantam Ball Bearing Co., South Bend, Ind.

BEARINGS (Radial)
Bantam Ball Bearing Co., South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Hyatt Roller Bearing Co., P. O. Box 476, Newark, N. J.
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SKF Industries, Inc., Front St. and Erie Ave., Philadelphia, Pa.
Timken Roller Bearing Co., Canton, O.

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Bantam Ball Bearing Co., The, South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Hyatt Roller Bearing Co., P. O. Box 476, Newark, N. J.
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Timken Roller Bearing Co., The, Canton, O.

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Bantam Ball Bearing Co., The, South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Hyatt Roller Bearing Co., P. O. Box 476, Newark, N. J.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
S K F Industries, Inc., Front St. & Erie Ave., Philadelphia, Pa.
Timken Roller Bearing Co., Canton, O.

BEARINGS (Roller Tapered)
Bantam Ball Bearing Co., South Bend, Ind.
Timken Roller Bearing Co., Canton, O.

BEARINGS (Rolling Mill)
Bantam Ball Bearing Co., South Bend, Ind.
Cramp Brass & Iron Foundries Co., Paschall Sta., Philadelphia, Pa.
Hyatt Roller Bearing Co., P. O. Box 476, Newark, N. J.
SKF Industries, Inc. Front St. & Erie Ave., Philadelphia, Pa.
Timken Roller Bearing Co., Canton, O.

BEARINGS (Thrust)
Bantam Ball Bearing Co. The, South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
S K F Industries, Inc., Front St. & Erie Ave., Philadelphia, Pa.
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on loading and unloading facilities at state line wharf for barge service. Equipment will include escalator or automatic loading device, crane, etc., costing about $80,000.

OAK GROVE, MO.—City has loan and grant of $51,000 to complete construction of deep well.

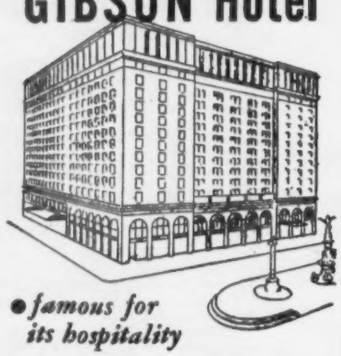
Nebraska

TAYLOR, NEBR. — Almeria public power and irrigation district, care of Howard Cole, recently organized, has had plans approved by state engineer for hydro-electric power plant and transmission lines, in connection with proposed irrigation system.

FAMOUS LANDMARKS

Washington has the CAPITOL

Cincinnati has the GIBSON Hotel



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Colorado

DENVER—Bureau of reclamation will take bids May 15, specification 682-D, for two direct-connected, motor-driven, deep-well, turbine-type pumping units to be used as sump pumps and two direct-connected, motor-driven deep-well, turbine-type pumping units to be used as drainage pumps in the tunnel plug outlet works at Boulder dam.

Idaho

BOISE, IDAHO—K. M. Robinson, general manager, Idaho Power Co., announces plans in preparation for construction of a $1,000,000 hydroelectric plant, expected to be in operation Jan. 1, 1936. The plant will be semi-automatic type and work involves penetrating a solid lava hill with a penstock. The company board has authorized a total of $1,300,000 for capital improvements this year.

Kentucky

CUMBERLAND, KY.—City has loan and grant of $97,000 for waterworks system.

LOUISVILLE, KY.—Anderson Wood Working Co. Inc., Beech and Woodlawn avenue, has been formed by Frank C. Anderson and R. Buhl Schiewer.

MURRAY, KY.—John G. Ryan, city attorney, is considering a bond issue for erection of power plant.

Alabama

CHILDERSBURG, ALA. — Town, M. L. Kidd mayor, receives bids May 10 for waterworks and sewerage system, including 75-gallon per minute deep well air lift pump, booster pump, pump house and pump and 75,000-gallon tank on 100-foot steel tower.

Maryland

CAMBRIDGE, MD.—Mayor and city council are contemplating erection of electric power plant at a cost of $400,000.

District of Columbia

WASHINGTON — District commissioners, room 320, District building, will take bids May 10 on machine tools.

WASHINGTON — Division of purchase, sales and traffic, department of agriculture, will take bids May 17, proposal 800, for installation of refrigeration and cold storage system in an existing cold storage fruit and vegetable products building in Meridian, Miss.

WASHINGTON—Bureau of supplies and accounts, navy department, will open bids May 10, schedules 4889, 4891, 4892, 4893, 4894, 4895, each specifying one motor-driven drilling machine, and schedule 4890 calling for two motor-driven drilling machines; schedules 4896 and 4897, each one motor-driven automatic lathe; schedule 4898, one motor-driven internal grinding machine; schedule 4899, one motor-driven, hydraulic driven table, surface grinder machine; schedule 4902, one motor-driven rotary surface grinder; schedule 4903, one motor-driven rotary grinding machine, schedule 4904, one motor-driven rotary surface grinder machine; schedule 4905, one motor-driven grinding machine; schedule 4907, one motor-driven plain internal grinding machine, all for delivery at Philadelphia.

Louisiana

GUEYDAN, LA.—City, Mayor Douglas, is preparing plans for erection of power plant.

Mississippi

STARKVILLE, MISS.—City, J. W. Maxwell mayor, is negotiating with Morgan Packing Co., Tuscaloosa, Ala., for establishment of packing plant.

North Carolina

CHARLOTTE, N. C.—General Motors Corp., General Motors building, Detroit, is considering erecting a $190,000 building on Hutchinson avenue, to serve as supply center for repair and replacement parts for all General Motors products.

RED SPRINGS, N. C.—James McKay, Dillon, S. C., is considering establishment of a foundry here.

South Carolina

GREENWOOD, S. C.—Greenwood county commissioners have plans complete and will receive bids May 27 for dam, power house and spillway in connection with Buzzards Roost project on Saluda river. Dan T. Duncan, engineer.

Tennessee

MEMPHIS, TENN.—United States engineer office, will take bids May 9, circular 341F, for two batteries of externally-fired marine boilers.

NASHVILE, TENN.—Smith Packing Co., 826 Third avenue, North, is erecting a plant to cost about $65,000.

SAVANNAH, TENN. — City, Bob Guinn Jr., has voted to install a water and sewer system, costing about $120,000.

West Virginia

FAIRMONT, W. VA.—Old Tavern Brewing Co., Frank C. Haymond attorney, has acquired the Monongahela Valley Brewing Co.'s plant on Washington street, which it plans to remodel.

HURRICANE, W. VA.—Town, J. E. Billups mayor, will receive bids May 7 for constructing complete water distribution system.

Virginia

McCOY, VA.—Big Vein Coal Co., is planning to build a power plant and will install new hoisting machinery.

PULASKI, VA.—Pulaski National bank has acquired the property of the Pulaski Foundry & Mfg. Co., including 5½ acres, main foundry, 18 smaller buildings and machinery and equipment.

Pacific Coast

PORTLAND, OREG.—Ross B. Cooper, county purchasing agent, will receive bids May 8 for construction of a rock crushing plant.

OLYMPIA, WASH.—Olympia Veneer Co. is building a storage warehouse, 40 x 90 feet, and is installing some new equipment.

SEATTLE—Department of the interior has opened bids for building materials, a complete sawmill, binders, mowers, plows, threshing outfit, small farm tools and 200 cook stoves for the Matanuska, Alaska, settlement project.

WHERE-TO-BUY

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The Stanley Works, New Britain, Conn. Bridgeport, Conn.
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Timken Steel & Tube Co., Canton, O.
Youngstown Sheet & Tube Co., Youngstown, O.

BLAST FURNACE SPECIALTIES
Bailey, Wm. M., Co., 702 Magee Bldg., Pittsburgh, Pa.

BLAST FURNACES—See FURNACES (Blast)

BLOWERS
Coppus Engineering Co., 359 Park Ave., Worcester, Mass.
General Electric Co., Schenectady, N. Y.
Ingersoll-Rand Co., Phillipsburg, N. J.
Strong, Carlisle & Hammond Co., The, 1400 W. 3rd St., Cleveland, O.

BOILER HEADS
Bethlehem Steel Co., Bethlehem, Pa.

BOILER TUBES—See TUBES (Boiler)

BOILERS
Babcock & Wilcox Co., The, 85 Liberty St., New York City.
Murray Iron Works Co., Burlington, Iowa.

BOLT AND NUT MACHINERY
Landis Machine Co., Waynesboro, Pa.
Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.

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H. K. Porter, Inc., Everett, Mass.

BOLTS
Bethlehem Steel Co., Bethlehem, Pa.
Illinois Steel Co., 208 S. La Salle St., Chicago, Ill.
Jones & Laughlin Steel Co., Jones & Laughlin Bldg., Pittsburgh, Pa.
Oliver Iron & Steel Corp., S. 10th & Muriel Sts., Pittsburgh, Pa.
Republic Steel Corp., Upson Nut Div., 1912 Scranton Rd., Cleveland, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

BORING MACHINES (Horizontal)
Landis Tool Co., Waynesboro, Pa.

BOXES (Annealing)
United Engineering & Foundry Co., First National Bank Bldg., Pittsburgh, Pa.
Wilson, Lee, Engineering Co., 1370 Blount St., Cleveland, O.

BOXES (Case Hardening)
Driver-Harris Co., Harrison, N. J.
Strong, Carlisle & Hammond Co., The, 1400 W. 3rd St., Cleveland, O.

BOXES (Open Hearth Charging)
Morgan Engineering Co., The, Alliance, O.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

BRAKES (Electric)
Clark, The, Controller Co., 1146 E. 152nd St., Cleveland, O.

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BRICK (Refractory)—See REFRACTORIES, CEMENT, DOLOMITE, etc.

BRICK (Silicon Carbide)
Carborundum Co., The, Perth Amboy, N. J.
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Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

BRIDGES, BUILDINGS, VIADUCTS, STACKS
American Bridge Co., Frick Bldg., Pittsburgh, Pa.
Belmont Iron Works, 22nd and Washington Ave., Philadelphia, Pa.
Blaw Knox Co., Farmers Bank Bldg., Pittsburgh, Pa.
McClintic-Marshall Corp., Bethlehem, Pa.
Ohio Structural Steel Co., The, Newton Falls, O.
Truscon Steel Co., Youngstown, O.

BRUSHES (Motor and Generator)
Ohio Carbon Co., The, 12508 Berea Rd., Cleveland, O.

BUCKETS (Clam Shell, Dragline, Grab, Single Line)
Atlas Car & Mfg. Co., The, 1140 Ivanhoe Rd., Cleveland, O.
Blaw Knox Co., Farmers Bank Bldg., Pittsburgh, Pa.
Harnischfeger Corp., 4411 W. National Ave., Milwaukee, Wis.
Industrial Brownhoist Corp., Bay City, Mich.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

BUILDINGS (Steel)—See BRIDGES, ETC.

BULLDOZERS
Beatty Machine & Mfg. Co., Hammond, Ind.

BURNERS (Acetylene)—See TORCHES AND BURNERS

BURNERS (Automatic)
Surface Combustion Co., 2375 Dorr St., Toledo, O.
Wean Engineering Co., Warren, O.
Wilson, Lee, Engineering Co., 1370 Blount St., Cleveland, O.

BURNERS (Fuel, Oil, Gas, Combination)
Babcock & Wilcox Co., The, 85 Liberty St., New York City.
Surface Combustion Co., 2375 Dorr St., Toledo, O.
Wean Engineering Co., Warren, O.
Wilson, Lee, Engineering Co., 1370 Blount St., Cleveland, O.

BUSHINGS (Bronze)
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
Gifford Engine Co., Lansing, Mich.
Shenango-Penn Mold Co., Dover, O.

BUSHINGS (Steel)
Danly Machine Specialties, Inc., 2147 So. 52nd St., Chicago, Ill.
Gifford Engine Co., Lansing, Mich.

BUSINESS CARDS (Engraved)
Modern Card Co., 1153 Fullerton Ave., Chicago, Ill.

BY-PRODUCT PLANTS
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CADMIUM
The Udylite Co., 1615 E. Grand Blvd., Detroit, Mich.

CADMIUM PLATING PROCESS
The Udylite Co., 1615 E. Grand Blvd., Detroit, Mich.

CAR DUMPERS
Industrial Brownhoist Corp., Bay City, Mich.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

CAR PULLERS and SPOTTERS
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.

CARBIDE
Linde Air Products Co., 30 E. 42nd St., New York City.

CARBON (Brushes and Specialties)
Ohio Carbon Co., The, 12508 Berea Rd., Cleveland, O.

CARS (Charging)
Atlas Car & Mfg. Co., The, 1140 Ivanhoe Rd., Cleveland, O.
Morgan Engineering Co., The, Alliance, O.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

CARS (Industrial and Mining)
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland.
Bethlehem Steel Co., Bethlehem, Pa.

CARS (Scale)
Atlas Car & Mfg. Co., The, 1140 Ivanhoe Rd., Cleveland, O.

CASTERS
Lansing Co., Lansing, Mich.

CASTINGS (Acid Resisting)
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
Chain Belt Co., 1660 W. Bruce St., Milwaukee, Wis.
International Nickel Co., Inc., 67 Wall St., New York City.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Shenango-Penn Mold Co., Dover, O.

CASTINGS (Alloy Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Pittsburgh Rolls Corp., 41st and Willow Sts., Pittsburgh, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Treadwell Engineering Co., Easton, Pa.
Union Steel Casting Co., 62nd & Butler Sts., Pittsburgh, Pa.
United Engineering & Fdry. Co., First National Bank Bldg., Pittsburgh, Pa.

CASTINGS (Brass, Bronze, Copper, Aluminum)
Aluminum Industries, Inc., 2348 Beekman St., Cincinnati, O.
Bethlehem Steel Co., Bethlehem, Pa.
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
Cramp Brass & Iron Foundries Co., Paschall Sta., Philadelphia, Pa.
Morgan Engineering Co., The, Alliance, O.
Shenango-Penn Mold Co., Dover, O.

CASTINGS (Electric Steel)
West Steel Casting Co., 805 E. 70th St., Cleveland, O.

CASTINGS (Gray Iron, Alloy, or Semi-Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Chain Belt Co., 1660 W. Bruce St., Milwaukee, Wis.
Cramp Brass & Iron Foundries Co., Paschall Sta., Philadelphia, Pa.
Erie Foundry Co., Erie, Pa.
Forest City Foundries Co., 2500 W. 27th St., Cleveland, O.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Midvale Co., The, Nicetown, Philadelphia, Pa.
Murray Iron Works, Burlington, Iowa.
National Roll & Foundry Co., The, Avonmore, Pa.
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.
Treadwell Engineering Co., Easton, Pa.

CASTINGS (Heat Resisting)
Driver-Harris Co., Harrison, N. J.

CASTINGS (Malleable)
Chain Belt Co., 1660 W. Bruce St., Milwaukee, Wis.
Lake City Malleable Co., 5026 Lakeside Ave., Cleveland, O.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Peoria Malleable Castings Co., Peoria, Ill.

CASTINGS (Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Mackintosh-Hemphill Co., 9th & Bingham Sts., Pittsburgh.
Mesta Machine Co., P. O. Box 1124, Pittsburgh, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
National Roll & Foundry Co., The, Avonmore, Pa.
Pittsburgh Rolls Corp., 41st and Willow Sts., Pittsburgh, Pa.
Standard Steel Works Co., Burnham, Pa.
Strong Steel Foundry Co., 33 Norris Ave., Buffalo, N. Y.
Treadwell Engineering Co., Easton, Pa.
Union Steel Casting Co., 62nd & Butler Sts., Pittsburgh, Pa.
United Engineering & Fdry. Co., First National Bank Bldg., Pittsburgh, Pa.
West Steel Casting Co., 805 E. 70th St., Cleveland, O.

CASTINGS (Worm & Gear Bronze)
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.

CEMENT (High Temperature)
Carborundum Co., The, Perth Amboy, N. J.
Norton Company, Worcester, Mass.
Strong, Carlisle & Hammond Co., The, 1400 W. 3rd St., Cleveland.

CHAIN (Draw Bench)
Chain Belt Co., 1660 W. Bruce St., Milwaukee, Wis.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.

CHAIN (Malleable)
Chain Belt Co., 1660 W. Bruce St., Milwaukee, Wis.
Lake City Malleable Co., 5026 Lakeside Ave., Cleveland, O.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.

CHAIN (Sprocket)
Chain Belt Co., 1660 W. Bruce St., Milwaukee, Wis.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Peoria Malleable Castings Co., Peoria, Ill.

CHAIN (Steel-Finished Roller)
Chain Belt Co., 1660 W. Bruce St., Milwaukee, Wis.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.

CHARGING MACHINES (Cupola)
Atlas Car & Mfg. Co., The, 1140 Ivanhoe Rd., Cleveland, O.
Morgan Engineering Co., The, Alliance, O.

CHARGING MACHINES (Open Hearth)
Morgan Engineering Co., The, Alliance, O.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

CHECKS (Metal)
Cunningham, M. E., Co., 107 E. Carson St., Pittsburgh, Pa.

CHISEL BLANKS
Pittsburgh Tool, Knife & Mfg. Co., 7501 Thomas Blvd., Pittsburgh, Pa.

CHROME ORE
Samuel, Frank, & Co., Inc., Harrison Bldg., Philadelphia.

CHROMIUM METAL
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.

CLEANING SPECIALTIES
American Chemical Paint Co., Ambler, Pa.

CLUTCHES (Magnetic)
Magnetic Mfg. Co., Dept. TL, 650 So. 28th St., Milwaukee, Wis.

COAL AND COKE
Alan Wood Steel Co., Conshohocken, Pa.
Cleveland-Cliffs Iron Co., Union Trust Bldg., Cleveland, O.
Hanna Furnace Corp., The, Detroit, Mich.
Interlake Iron Corp., Union Trust Bldg., Cleveland, O.
Pickands, Mather & Co., Union Trust Bldg., Cleveland, O.
Shenango Furnace Co., Oliver Bldg., Pittsburgh, Pa.
Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.
Youngstown Sheet & Tube Co., Youngstown, O.

COAL, ORE AND ASH HANDLING MACHINERY
Atlas Car & Mfg. Co., The, 1140 Ivanhoe Rd., Cleveland, O.
Industrial Brownhoist Corp., Bay City, Mich.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.

COKE—See COAL AND COKE

STATISTICS OF IRON AND STEEL INDUSTRY

From department of commerce except shipments by U. S. Steel Corp., foundry equipment by Foundry Equipment Manufacturers association, river traffic by U. S. engineers at Pittsburgh, electric power by geological survey

U. S. Steel Corp.

	Automobiles			Shipments	Fabricated Shapes		Fabricated Plates			Foundry Equipment Order Index†
	Production —United States—		Canada	To consumers only, inter-company shipments not included	75-80 Per Cent of Industry Reporting			Net Tons Bookings		
1933	Total*	Passenger cars	Total	Tons	Net Tons Bookings	Net Tons Shipments	Total	Oil Storage Tanks	Miscellaneous	
Year	1,920,057	1,573,512	65,924	5,805,235	757,530	700,373	199,031	55,025	119,569	....
1934										
Jan.	155,666	112,754	6,904	331,777	74,358	46,774	15,897	3,754	10,512	37.2
Feb.	230,256	186,774	8,571	385,500	60,036	38,101	14,641	2,476	10,452	65.8
Mar.	338,434	279,274	14,180	588,209	82,250	50,685	38,924	2,202	33,806	75.4
April	352,975	288,355	18,363	643,009	98,383	66,782	20,085	2,998	13,447	67.8
May	330,455	273,764	20,161	745,063	62,391	82,735	21,891	8,746	10,802	66.3
June	306,477	261,280	13,905	985,337	97,390	81,877	27,395	11,019	13,642	70.4
July	264,933	223,094	11,114	369,938	57,234	80,326	12,523	2,028	7,901	50.7
August	234,811	183,500	9,904	378,023	73,559	95,864	16,293	3,334	10,855	43.1
Sept.	170,007	125,040	5,579	370,306	48,701	80,869	15,108	3,445	8,218	46.4
Oct.	131,991	84,003	3,780	343,962	51,002	97,853	16,581	927	12,557	55.3
Nov.	83,482	49,020	1,697	366,119	71,115	88,006	16,629	3,252	10,252	80.4
Dec.	153,624	111,061	2,732	418,630	50,720	69,911	26,025	5,185	15,318	66.9
Year	2,753,111	2,177,919	116,890	5,925,873	827,139	879,783	241,992	49,366	157,762	....
1935										
Jan.	292,765	229,199	10,607	534,055	49,575	70,659	18,778	1,389	15,310	86.6
Feb.	340,544	278,150	18,114	583,157	57,274	52,665	15,064	2,531	10,556	74.2
2 Mo.	633,309	507,349	28,721	1,117,212	106,849	123,324	33,842	3,920	25,866	....
March	429,830	361,813	21,975	668,056	78,468	65,103	.....	.....	.....	68.0
3 Mo.	1,063,139	869,162	50,696	1,785,248	185,317	188,427	.....	....	.....	....

*Difference of total and passenger cars equals number of trucks. †Average monthly shipments, 1922-23-24 taken as 100.

	Malleable Castings			Steel Castings		Mech. Stokers		Steel Furniture		Babbitt Metal	
	Net Tons			Net Tons		—Sales—		Dollars		Pounds 000 omitted	
1933	Output	Shipments	Orders booked	Total bookings	Total production	Fire tube boilers	Water tube boilers	Business shipments	Shelving, shipments	(a) Total Production	(b) Sales
Year	268,617	256,419	258,082	280,231	277,678	1,231	421	7,697,125	1,870,318	22,812	17,876
1934											
Jan.	30,417	26,642	32,501	26,296	27,644	117	23	993,473	210,205	2,256	1,838
Feb.	33,939	31,412	36,594	35,698	28,526	52	25	894,076	279,391	2,147	1,715
March	43,438	41,530	42,961	60,044	39,475	65	44	955,633	394,371	2,474	1,976
April	40,742	39,817	38,453	63,142	46,242	50	40	934,097	346,403	2,527	1,964
May	37,165	39,493	32,639	46,831	57,313	115	35	1,010,528	288,446	2,425	1,889
June	28,340	31,607	24,499	41,537	50,268	120	52	1,045,539	354,050	2,261	1,618
July	23,388	27,591	21,862	41,822	46,182	131	69	863,439	230,821	1,988	1,435
August	23,910	25,784	21,306	25,538	43,748	191	50	1,101,469	225,811	1,856	1,399
Sept.	21,541	20,360	19,511	20,030	31,816	248	39	879,243	260,545	1,653	1,273
Oct.	25,317	21,683	18,785	24,327	29,142	248	44	997,859	223,769	1,807	1,364
Nov.	28,515	21,615	28,530	21,552	25,799	180	25	1,038,951	216,704	1,725	1,327
Dec.	32,746	29,593	36,505	27,312	23,916	137	30	1,090,171	207,883	2,163	1,622
Year	369,458	357,127	354,146	434,131	450,087	1,654	476	11,807,843	3,243,636	25,287	19,425
1935											
Jan.	43,400	41,182	44,568	32,349	29,035	103	36	1,139,497	244,759	2,400	1,992
Feb.	41,377	37,650	41,225	31,725	29,687	68	37	1,064,219	251,054	2,138	1,677
2 Mo.	84,777	78,832	85,793	64,074	58,722	171	73	2,203,716	495,813	4,539	3,670
March	42,808	42,975	40,237	.....	.....	66	40	1,220,535	340,015	2,280	1,746
3 Mo.	127,585	121,807	126,030	.....	.....	237	113	3,424,249	835,828	6,820	5,416

(a) by 40 plants. (b) by 30 manufacturers who produce for sale, including 5 who also report consumption of own metal.

	Coke		Electric Power	Steel Barrels		River Traffic			Steel Boilers		
	Net Tons Production		Millions Kilowatt Hours	Units		Net Tons			New Orders		
1933	By-Product	Beehive	Production*	Production	Shipments	Allegheny	Monongahela	Ohio	Total	Units Stationary	Marine
Year	26,722,400	829,500	85,260	6,571,581	6,560,258	31,007	467,841	509,011	4,118	3,920	198
1934											
Jan.	2,475,785	107,900	7,631	708,086	706,209	590	27,158	54,109	249	239	10
Feb.	2,493,494	129,100	7,049	573,391	572,915	520	12,429	4,373	212	198	14
March	2,968,573	161,400	7,717	695,681	703,101	2,180	40,685	47,897	294	283	11
April	2,875,451	71,600	7,443	657,185	658,216	5,100	51,995	72,974	380	361	19
May	3,191,869	63,200	7,683	494,051	489,186	3,050	72,922	73,361	304	294	10
June	2,989,875	61,100	7,472	701,826	696,349	10,195	54,913	83,718	415	402	13
July	2,381,459	50,700	7,605	598,745	608,644	2,950	41,231	60,005	455	452	6
August	2,279,672	43,700	7,710	361,852	364,081	2,015	32,412	45,840	597	584	13
Sept.	2,174,771	54,800	7,206	412,592	417,114	3,750	35,411	45,848	626	594	32
Oct.	2,316,858	75,900	7,831	583,151	575,281	3,400	43,347	46,475	696	677	19
Nov.	2,267,462	94,100	7,606	467,699	466,933	4,300	48,556	51,710	447	436	11
Dec.	2,417,841	83,600	8,058	422,985	424,233	1,300	42,248	46,887	331	321	10
Year	30,833,110	997,100	91,011	6,677,322	6,682,400	39,350	503,307	633,197	5,009	4,841	168
1935											
Jan.	2,801,552	88,000	8,334	437,442	438,334	1,075	48,831	52,565	329	300	29
Feb.	2,780,632	92,800	7,508	404,203	402,928	1,050	53,759	64,369	296	287	9
2 Mo.	5,582,184	180,800	15,842	841,645	841,262	2,125	102,590	116,934	625	587	38
March	2,911,292	101,400	.....	524,937	525,022	2,100	62,316	75,072	418	412	6
3 Mo.	8,493,476	282,200	.....	1,366,582	1,366,284	4,225	164,906	192,006	1,043	999	44

*For public use.